

Technical COMMUNICATION

Journal of the Society for Technical Communication

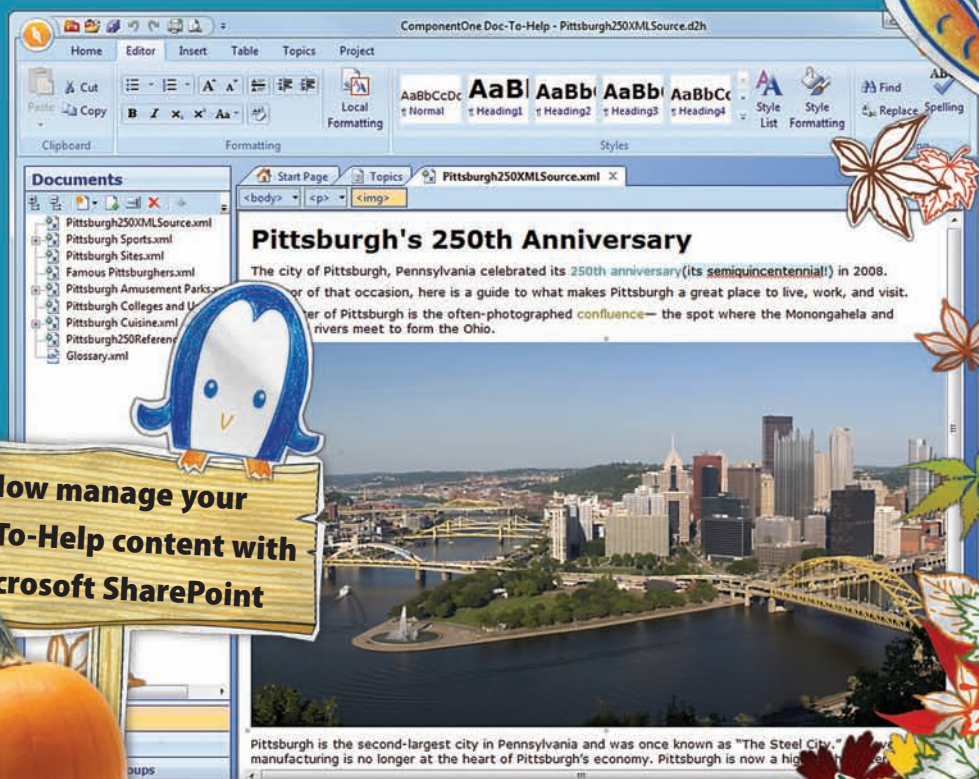
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What is a technical communicator? Technical communicators develop and design instructional and informational tools needed to ensure safe, appropriate, and effective use of science and technology, intellectual property, and manufactured products and services. Technical communicators combine multimedia knowledge and strong communication skills with technical expertise to provide education across the entire spectrum of users' abilities, technical experience, and visual and auditory capabilities. For more information visit www.stc.org/story/tc_tw.asp.

The Society for Technical Communication is the largest association of technical communicators in the world. STC is currently classifying the Body of Knowledge for the field and communicating the value of technical communication. Its volunteer leadership continues to work with government bodies and standards organizations to increase awareness and accurate perception of technical communication. Membership is open to all with an interest in technical communication. Visit the STC Web site (www.stc.org) for details on membership categories, fees, and benefits.

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STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION

TECHNICAL COMMUNICATION (ISSN 0049-3155) is published four times a year by the Society for Technical Communication, a nonprofit educational organization, as a service to the membership.

The mailing address of both the publication and the publisher is 9401 Lee Highway, Suite 300, Fairfax VA 22031-1803. The publisher is Susan Burton, and the editor is Menno deJong. The owner of the publication is the Society for Technical Communication. Members pay \$75 for a print subscription and nonmembers pay \$400.

There were 600 copies of TECHNICAL COMMUNICATION published in August 2010. The average for the preceding 12 months was 2,025. The paid/requested outside-county mail subscriptions for the August 2010 issue were 542; the average for the preceding 12 months was 1,975. Total distribution for August 2010 was 567. The average for the preceding 12 months was 2,000. Twenty-five free copies of TECHNICAL COMMUNICATION were distributed by mail in August 2010 and the average number of free copies distributed during the preceding 12 months was 25. Thirty-three copies of TECHNICAL COMMUNICATION were not distributed in August 2010, and the average number of copies not distributed during the preceding 12 months was 25. The percent paid/requested circulation in August 2010 was 96 percent; for the preceding 12 months, percent paid/requested circulation was 99 percent.

INSTRUCTIONS FOR AUTHORS

About the Journal

Technical Communication is a peer-reviewed, quarterly journal published by the Society for Technical Communication (STC). It is aimed at an audience of technical communication practitioners and academics. The journal's goal is to contribute to the body of knowledge of the field of technical communication from a multidisciplinary perspective, with special emphasis on the combination of academic rigor and practical relevance.

Technical Communication publishes articles in five categories:

- **Applied research** – reports of practically relevant (empirical or analytical) research
- **Applied theory** – original contributions to technical communication theory
- **Case history** – reports on solutions to technical communication problems
- **Tutorial** – instructions on processes or procedures that respond to new developments, insights, laws, standards, requirements, or technologies
- **Bibliography** – reviews of relevant research or bibliographic essays

The purpose of *Technical Communication* is to inform, not impress. Write in a clear, informal style, avoiding jargon and acronyms. Use the first person and active voice. Avoid language that might be considered sexist, and write with the journal's international audience in mind.

Our authority on spelling and usage is *The American Heritage Dictionary*, 4th edition; on punctuation, format, and citation style, the *Publication Manual of the American Psychological Association*, 6th edition.

Manuscript Preparation and Submission

Submitting a manuscript to *Technical Communication* for review and possible publication implies that its submission has been approved by all authors, researchers, and/or organizations involved, that the manuscript (or a substantial portion) has

not been published before, and that the manuscript is not under review elsewhere.

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Check all author-date citations within the text and all entries in the reference list for both accuracy and conformance to the *Publication Manual of the American Psychological Association* (APA), pp. 169–224.

Submit your manuscript as a double-spaced electronic file with one-inch margins. Do not attempt to mimic the format or layout of a published article. Keep the layout as clean and simple as possible.

Microsoft Word files are preferred. If you use another word processor, a Rich Text Format (RTF) file is also acceptable.

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- Page 3: Up to five keywords and a practitioner's take-away (maximum 100 words) – A bulleted list summarizing the practical implications of the article
- Page 4: Start of the manuscript
- References
- Tables and figures – Start each table or figure on a new page.

Send the manuscript as an attachment to an e-mail message to the editor-in-chief, Menno de Jong (e-mail: TCEditor@gw.utwente.nl).

Review Process

The editor-in-chief will read your manuscript and check its potential suitability for the journal. In the case of a positive outcome, the manuscript will be sent to three independent referees for a double-masked review. On the basis of the referees' recommendations, the editor will send you a decision about the manuscript. There are five possibilities: (1) reject, (2) revise and resubmit, (3) accept with major revisions, (4) accept with minor revisions, and (5) accept as is.

Copyrights

The Society for Technical Communication requires that authors transfer copyrights to STC for articles appearing in *Technical Communication* and grant STC permission to post the articles on *Technical Communication Online* for an indefinite period. STC will grant colleges, universities, and libraries the right to use the articles free of charge for educational purposes.

Developments in Technical Communication: Journal Articles Between 2006 and 2010

Of the various academic and professional communication disciplines, technical communication should be the one that is flourishing. Technology increasingly pervades our personal and professional lives. It solves some of our problems and satisfies some of our needs. At the same time, technology creates new problems, incites new needs, and changes many of our habits. It is hard to imagine life without technology, but technology does not necessarily speak for itself.

It is as hard to think of technology without communication as it is to think of communication without technology. Technical communication is the discipline where the two phenomena meet. In the past, they seemed to meet as separate entities: The technical communicator was there to explain technological inventions to the public of users. The technical communicator could afford to be simply a technologically savvy writer. Nowadays, the two tend to be more integrated. As a result, the technical communicator has to gain expertise in many different areas.

To further explore the various aspects of the relationship between communication and technology, I went through the past five volumes of *Technical Communication*. I was curious to see what kinds of general

topics would emerge from this exercise.

Design of Documents, Web Sites, and Presentation Slides

The quality, effectiveness, and usability of means of communication is one of the recurring topics in the journal, but it is not nearly as prominent as I would have expected. The classical document design problem of tailoring texts to the needs and preferences of readers is by no means solved, but the research attention to this problem seems to have decreased. This is particularly true for paper documents. A little more attention is paid to Web site design, often with emphasis on other variables than in document design research (e.g., attracting visitors or personalizing information). A special issue was devoted to accessibility. Another development is the growing research attention to PowerPoint or other presentation slides. Many articles in the past five years were devoted to the design of effective slides. *Technical Communication* may even be considered to play a leading role regarding that particular topic.

In addition to the verbal characteristics of documents, Web sites, or presentations, several articles focus on the visual aspects of communication such as color use,



fonts, illustrations, and graphics. I hope these articles will form the foundation on which to build more empirical research.

Design Processes: Writing, Editing, Evaluating, and Reviewing

Traditionally, there has been a strong process orientation in the technical communication literature. Instead of exclusively focusing on the effects communication variables may have on users, many articles investigate the way communication means are (or can be) developed. Some articles investigate how communication means are designed in organizational contexts, for instance focusing on the collaboration between writers and engineers. Other articles discuss or investigate the strategies that can be used to inform design processes, such as research or analysis in the predesign phase or expert-focused or user-focused formative evaluation. Examples of the former are the use of narratives or scenarios. Examples of the latter are heuristic evaluation, think-aloud usability testing, and the use of eyetracking. Other contributions

focus on the practices of editing and reviewing in design processes.

Technology and Communication

Many contributions focus strongly on the technological side of communication. Technology provides new opportunities for communicating with audiences, for instance by using the potential benefits of games, virtual reality, or interactivity. Technical communicators are particularly well equipped to advise on the use of technology in professional communication, and it is important to keep up with the latest developments. Technology also impacts how technical communicators work. One can think of developments in information architecture, single sourcing, content management, and wikis.

Education and Training

Much attention has also been paid to academic curricula in technical communication. A special issue was devoted to the topic of assessment in academic programs. Other articles focused on the content of undergraduate and graduate programs, or on the pros and cons of particular training strategies. One article addressed the skills and competencies that technical communicators need to be successful in job applications. It would be interesting to further explore the skills and competencies required (not only according to employers but also according to experienced technical communicators) and use them to evaluate technical communication programs. This corresponds to the issue of professional expertise: Which skills and competencies

make someone an outstanding technical communication professional?

International and Intercultural Communication

Many articles address the issue of international and/or intercultural communication. Technical communication does not stop or start at the borders of the western world. It is a worldwide phenomenon. Articles have been devoted to intercultural comparisons, but also to gaining a deeper understanding of technical communication in nonwestern cultures. Interestingly, the awareness has grown that important intercultural differences also occur within the western countries.

Legal Issues

Recently, several authors have drawn attention to the importance of legal issues for technical communicators. This has become especially important since the rise of digital media. Copyright issues have never been as prominent as today, when copying and distributing information have become easier than ever. A special issue in the third issue of this year's volume provides a great overview of legal issues that may be relevant for technical communicators, and places them in an international context.

Contextual Developments

The last broad category of articles that I would like to mention draws attention to various issues that are not at the core of being a technical communicator but that may nonetheless affect their work. Some articles address the organizational contexts in which technical communicators work. Others discuss

societal or professional developments that may be relevant for technical communicators, such as offshoring and outsourcing, sustainability, or the rise of open source software.

Looking Back and Looking Ahead

The categories of articles described above demonstrate the diversity in our field. I must acknowledge that there have been really great contributions that do not fit in well in the categories I mentioned. One was a special issue on qualitative research, which drew attention to the importance of research in general and qualitative research approaches in particular. Many articles in other journal issues have also demonstrated the importance of research for the advancement of technical communication. Research in all categories is of vital importance for the development of the academic and professional discipline.

In This Issue

Because of the number of pages in the third issue of this volume (the special issue about legal issues in a global context), this last issue of 2010 contains only two articles. In the first article, David Dayton and Keith Hopper report on a survey of STC members regarding their use of and experiences with single sourcing and content management. In the second article, Lisa Meloncon, Erin Haynes, Megan Varelmann, and Lisa Groh report on a research project aimed at formulating guidelines for educational Web sites for children. They combined a literature review with a usability test of an educational Web site and compiled a list of guidelines for navigation, appearance, and content.

Single Sourcing and Content Management: A Survey of STC Members

David Dayton and Keith Hopper

Abstract

Purpose: To gather reliable empirical data on (1) STC members' use of and attitudes toward single sourcing and/or content management (SS/CM) methods and tools; (2) factors perceived to be driving or impeding adoption of this technology; (3) transition experiences of adopting work groups; (4) perceived impacts of SS/CM methods and tools on efficiency, usability, customer focus, and job stress.

Method: Cross-sectional sample survey of 1,000 STC members conducted in May 2008; multiple survey contacts by email with link to online survey instrument.

Results: Of 276 respondents, half reported using SS/CM methods and tools. About 1 in 10 respondents reported experience with a failed implementation of SS/CM; half the SS/CM users reported significant downsides or tradeoffs. Perceived top drivers of SS/CM adoption were faster development, lower costs, regulatory and compliance pressures, and translation needs. About 1 in 9 respondents used Darwin Information Typing Architecture (DITA). Large company size made use of SS/CM significantly more likely, and work groups using single sourcing with content management were significantly larger than work groups of other SS/CM subgroups and non-users of SS/CM. Single sourcing without content management seems destined to achieve a larger proportion of adopters than single sourcing with content management, barring a technology breakthrough. Among all respondents, Microsoft Word and FrameMaker were the most-used primary authoring tools.

Conclusions: With regard to these methods and tools, STC members appear to be in the Early Majority phase of Everett M. Rogers's innovation adoption curve. Diffusion of these methods and tools appeared to have been steady in the five years prior to the survey, with no dramatic increase in more recent pace of adoption.

Keywords: single sourcing, content management, methods and tools, technology transfer, survey methods

Practitioner's Takeaway

- Data from May 2008 show that single sourcing and content management were slowly and steadily being adopted by technical communication workgroups; however, these methods and tools were diverse, and no single kind of SS/CM method or tool seemed destined to become dominant.
- Single sourcing, both with and without content management, apparently had reached a critical mass of adopters, but content management without single sourcing had not.
- Microsoft Word and FrameMaker were respondents' most-used primary authoring tools, and more than three times as many respondents produced PDF files as produced content using the Extensible Markup Language or its predecessor, Standard Generalized Markup Language.

Single Sourcing and Content Management

Introduction

During the past decade, scores of authors from both academic and practitioner ranks of technical communication have written and talked about methods and tools associated with the terms *single sourcing* and *content management*. Despite the steady flow of information and opinions on these topics (see Appendix A for a brief annotated bibliography), we have not had hard data on how many practitioners use such methods and tools and what they think about them. To fill that gap, we conducted a probability sample survey of STC members in May 2008.

We begin our report by defining key terms. In Objectives and Methodology, we state what we set out to learn, explain how we designed, tested, and deployed the survey, and describe how we analyzed the data. We organize the Summary of Results with statements summing up the most noteworthy findings that we took from the data, which we report in abbreviated form. In the Conclusions section, we recap and briefly discuss what the survey results tell us about STC members' use of single sourcing and content management.

Definitions Used in the Survey

Any discussion about single sourcing and content management should begin by defining those terms carefully. The terms are not synonymous, though often conflated, as anyone who researches these topics quickly discovers. Searching bibliographic databases or the Web using the term *single sourcing*, you may find case stories about single sourcing carried out using a content management system (e.g., Happonen & Purho, 2003; Petrie, 2007), but you may also find that a case is about an application or method that does not include a content management system (Welch & Beard, 2002). Likewise, results produced by the search term *content management* will list articles about a system that enables single sourcing (Hall, 2001; Pierce & Martin, 2004) as well as articles about a Web content management system lacking the functionality that would enable single-source publishing (McCarthy & Hart-Davidson, 2009; Pettit

Jones, Mitchko, & Overcash, 2004). Indeed, many Web content management systems are designed in ways that make single sourcing impossible.

In our survey, we defined single sourcing by quoting a widely recognized authority on the topic (Ament, 2003). Kurt Ament defines single sourcing as

a method for systematically re-using information [in which] you develop modular content in one source document or database, then assemble the content into different document formats for different audiences and purposes (p. 3).

We want to emphasize that true single sourcing does not include cutting and pasting content from the source to different outputs; single sourcing uses software so that different outputs can easily be published from a single source document or database.

If we were to repeat the survey, we would revise Ament's definition to "you develop modular content in one source document, *Help project*, or database." Widely used Help authoring tools such as Adobe RoboHelp and MadCap Flare enable single sourcing as Ament defines it, but their primary content repository is a project, which is neither a document nor, strictly speaking, a database. A Help project collects and stores all the files needed to publish content, which can be customized for different audiences and products and/or different outputs, such as Web help and manuals in PDF (portable document format). Those who insist on absolute semantic precision with regard to this topic can expect to be frustrated for some time to come. The evolution of Help authoring applications like those mentioned (and others, no doubt) will even more thoroughly blur the distinction between single sourcing and content management.

We wanted our survey respondents to think of single sourcing as a method of information development distinct from content management systems, which we defined as a method-neutral technology:

For the purposes of this survey, content management systems are applications that usually work over a computer network and have one or more databases at their core; they store content, as whole

documents and/or as textual and graphical components; they mediate the workflow to collect, manage, and publish content with such functions as maintaining links among content sources and providing for revision control. They may be used in conjunction with single sourcing, but some types of content management systems are not compatible with single sourcing.

Before composing this definition, we reviewed the extended definitions of content management systems offered by Rockley (2001), Rockley, Kostur, and Manning (2002), and Doyle (2007). Our goal was to provide respondents with a distilled description leading them to focus on a networked information system and not on a general information management process. (See Clark [2008] for a discussion of process versus technology in defining content management, as well as descriptions of general types of content management systems.)

We use the following terms and abbreviations to refer to the three possible situations that apply to technical communication work groups with regard to the use of single sourcing and content management systems:

- Single sourcing without a content management system (SS)
- Single sourcing with a content management system (SSwCM)
- No single sourcing but use of a content management system (CM)

Note that we use SS/CM as shorthand for “SS and/or CM”—in other words, whenever we refer to the group of respondents who reported using SS only, CM only, or SSwCM. In reporting our results, we often compare the group composed of all SS/CM respondents with the group composed of all whose work groups did not use any SS/CM method or tool. Within the main group of interest—the users of SS/CM—we often break down the results for the three subgroups: SS only, CM only, and SSwCM.

A few additional definitions are needed because it is impractical to discuss this topic without them.

Extensible Markup Language (XML) is an open-source, application-independent markup language frequently used in (though not required by) tools across the spectrum of SS/CM applications and systems. XML is becoming a universal markup language for information development and exchange. Many times, people using XML-based tools are unaware of XML’s role, as when one saves a document in Word 2007’s default “.docx” format, which is a zip file containing XML components. Our survey included questions about the use of XML and its precursor, SGML (Standard Generalized Markup Language), as well as a question about three standards for implementing XML to develop and manage documentation: DocBook, Darwin Information Typing Architecture (DITA), and S100D (a standard used in the aerospace and defense industries).

Objectives and Methodology

Our study had the following four objectives, to:

1. Produce a cross-sectional statistical profile of SS, CM, and SSwCM use by STC members
2. Identify important factors perceived by STC members to be driving or impeding the adoption of SS, CM, and SSwCM methods and tools
3. Gather data on the transition experiences of work groups after they adopted these methods and tools
4. Learn whether and how these methods and tools are perceived by STC members using them to have impacts on efficiency, documentation usability, customer focus, and job stress

Development of the Survey

The survey was the central element of a multimodal research proposal that Dayton submitted to the STC Research Grants Committee, a group of prominent academics and practitioners with many years of experience conducting and evaluating applied research projects. Dayton revised the first formal draft of the survey in response to suggestions from the committee, which recommended to the STC Board that the revised proposal receive funding. The Board approved the funding in June 2007, and Dayton obtained approval for the study from the Institutional Review Board

Single Sourcing and Content Management

(IRB) for the Protection of Human Participants at Towson University in Maryland.

Based on several formal interviews and some informal conversations with technical communicators about single sourcing and content management methods and tools, Dayton revised the survey and solicited reviews of the new draft from three practitioners with expertise in the subject matter and from an academic with expertise in survey research. Dayton again revised the survey in response to those reviewers' suggestions. Hopper then converted the survey into an interactive Web-delivered questionnaire using Zoomerang (a copy of the survey that does not collect data may be explored freely at <http://www.zoomerang.com/Survey/WEB22B38UWBJKZ>).

Moving the survey from a page-based format to multi-screen Web forms proved challenging. Multiple branching points in the sequence of questions created five primary paths through the survey: no SS/CM, SS only, CM only, SSwCM, and academics. Respondents not using SS or CM were presented with 20 or 21 questions depending on whether their work group had considered switching to SS/CM methods and tools. Respondents in the three subgroups of SS/CM were presented with 30 to 33 questions, depending on their answers to certain ones. The version of the survey for academics contained 24 questions, but we ultimately decided to leave academics out of the sampling frame for reasons explained later.

For all paths through the survey, question types included choose one, choose all that apply, and open ended. All fixed choice questions included a final answer choice of "Other, please specify" followed by a space for typing an open-ended answer. The first complete draft of the Web-based survey was pilot tested by about 30 participants, which included practitioners, graduate students, and academics. The reported times for completing the survey ranged from less than 8 to 25 minutes. Testers who went through the path for academics and the path for those not using SS or CM reported the fastest completion times and offered the fewest suggestions. Testers answering the questions for those using SS/CM suggested some improvements in wording, formatting, and answer options, most of which we agreed with and made changes to address.

Deployment of the Survey

The version of the survey for academics was entirely different from the four variations for practitioners. Following the pilot test, we reassessed the pros and cons of fielding two surveys at the same time. We were particularly concerned that the number of academic respondents would be quite small unless we drew a separate sample of only academic members. After the STC Marketing Manager assured us that academics could be filtered from the membership database before drawing a sample, we decided to limit the sampling frame to practitioners. (The sampling frame is the total population of people from whom the random sample is drawn.)

The sampling frame consisted of about 13,500 STC members, about 3,000 fewer than the total membership at that time (May 2008). In addition to excluding academics, students, and retirees, the STC Marketing Manager also excluded STC members who had opted not to receive messages from third-party vendors. From the sampling frame of about 13,500 members, the STC Marketing Manager drew a random sample of 1,000 using an automated function for that purpose available in the STC office's membership database application.

Over 11 days, the Marketing Manager e-mailed to the sample four messages that we composed. The first e-mail went out on a Thursday: a brief message from STC President Linda Oestreich describing the survey and encouraging participation. The second e-mail was sent the following Tuesday, signed by us, inviting recipients to take the survey and providing a link to the consent form. (Researchers working for federally funded institutions are required by law to obtain the informed consent of anyone asked to participate in a research study.) Respondents accessed the survey by clicking the link at the bottom of the consent form. (Appendix C contains copies of the two e-mails mentioned above and the consent form.)

The Internet server housing the survey was configured to prohibit multiple submissions from the same computer. When a respondent completed the survey by clicking the Submit button on the final screen, a confirmation page displayed our thank-you message and offered respondents the option of e-mailing the

STC Marketing Manager to be taken off the list of those receiving reminder e-mails. In addition, respondents could check an option to receive an e-mail from STC after the survey had closed, giving them an early look at the results.

We received data from 117 respondents within 24 hours of sending out the first e-mail with a link to the survey. Based on the response time data that we had obtained in previous online surveys, this level of initial response suggested that we were headed for a lower than anticipated response rate. Two days after our first e-mail with a link to the survey went out, the first reminder e-mail was sent—with a revised subject line and sender address. The initial two e-mails had been configured to have *stc@stc.org* as the sender, which we feared might be leading some recipients to delete it reflexively or to filter it to a folder where they would not see it until it was too late to take the survey. We arranged with STC staff to have the reminder e-mails show the sender as *david_dayton@stc.org*, an alias account. A second and final reminder was e-mailed the following Monday, 11 days after the advance notice e-mail went out.

The sequencing, timing, and wording of the four messages e-mailed to the 1,000 STC members in the sample were based on best practices for conducting Internet surveys (cf. especially Dillman, 2007). Because we did not have direct control over the sampling frame and the mass e-mails used to distribute the survey invitations, some aspects of the survey deployment did not meet best-practices standards; specifically, our e-mailed invitations lacked a personalized greeting and, for the first two e-mails, also contained impersonal sender-identifying information.

Response Rate

Two weeks after the first e-mail went out to STC members in the sample, the survey closed. We had received data from 276 practitioners who completed the survey. We will not report data from four other respondents who answered the version of the survey for academics, and we discarded partial data from 46 participants who abandoned the survey after starting to fill it out. Using the standard assumption that the 1,000 e-mailed survey invitations were all received by those in the sample, the response rate was 28%,

slightly better than other recent STC surveys. (The last salary survey that STC invited 10,000 members to take in 2005 had a response rate of 23%. A sample survey conducted by a consulting firm hired in 2007 to collect members' opinions about STC publications had a response rate of 22%.) Our survey's response rate of 28% may represent a source of bias in the survey results. We comment on this briefly toward the end of the summary of results and discuss it in some depth in Appendix B, where we review recent research and thinking about low response rates from the social science literature.

Data Analysis Methods

Data from submitted surveys were collected in a text file on the Zoomerang.com server and downloaded after the survey closed. Microsoft Excel 2007 was used to create frequency tables and bar graphs to examine descriptive statistics for each survey question. Data from key variables were sorted by technology type—SS only, CM only, or SSwCM—and tested for significant differences or associations using statistical software to run the most appropriate procedures based on the level of the data. Standard measures were used to calculate the strength of any statistically significant differences or associations ($p \leq .05$). Please note that data are rounded to whole numbers using the “round up for odd, down for even” rule when the exact proportion produces a 5 after the decimal point; thus, the whole numbers for the same item will occasionally not add up to 100%. For example, 18.5% will be reported as 18%, while 19.5% will be reported as 20%. This is a standard rounding protocol intended to produce greater clarity in reporting the results for this type of survey.

Summary of Results

In this section, we present a summary of the survey data organized under headings that highlight the most noteworthy results. Readers wishing to explore the survey data in more depth may visit the STC Live Learning Center (www.softconference.com/stc/), which has an audio recording and PowerPoint slidedeck of our presentation at the STC 2009 Summit.

Single Sourcing and Content Management

Four of Five Were Regular Employees; Half Worked in High-tech

The group profile of our 276 respondents in terms of employment status and industry seems typical of the STC membership before the current economic recession: 81% were regular employees; 18% were contractors, consultants, freelancers, or business owners; and 2% were unemployed. Respondents worked for a wide range of industries, though a little more than half worked in industries commonly clustered under the rubric “high-technology”: companies making or providing software, computer and networking hardware, software and IT services, and telecommunications products and services.

Slightly More Than Half Worked in Large Companies

We asked respondents to categorize the size of the company they worked at. Table 1 shows that the range of company sizes was weighted slightly (55%) toward companies with more than 500 employees, and the largest category proportionately is 10,000 or more employees, with 25%. (The Small Business Administration most often uses 500 employees as the maximum size company allowed to access its programs.) Table 1 includes Census Bureau data for the entire U.S. economy in 2004 as comparative data.

Table 1. Company Size Reported by Respondents Compared with 2004 U.S. Census Data

Company Size	% of 276 STC respondents	% of U.S. Census Data 2004*
1 to 4	7%	5%
5 to 9	2%	6%
10 to 19	2%	7%
20 to 99	14%	18%
100 to 499	21%	15%
500 to 999	7%	5%
1,000 to 9,999	22%	18%
10,000 or more	25%	26%

*Source: Statistics about Business Size (including Small Business) from the U.S. Census Bureau, Table 2a. Employment Size of Employer and Nonemployer Firms, 2004. Accessed August 16, 2009, at <http://www.census.gov/epcd/www/smallbus.html>

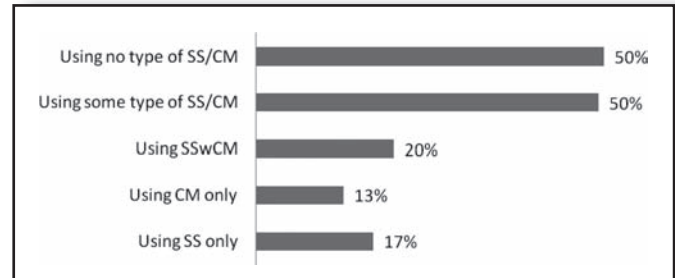


Figure 1. Use of SS/CM by 276 Survey Respondents

Half Used SS Only, CM Only, or SS With CM—and Half Used No SS/CM

Of the 276 respondents, 139 (50%) reported that they did not use SS/CM methods and tools, and 137 (50%) reported that they did (see Figure 1). In the SS/CM group, SSwCM users were the most numerous (55, or 20% of all respondents), followed by SS only (47, 17%) and CM only (35, 13%).

As Figure 2 shows, about two-thirds of SS/CM users reported that their work groups produced more than half their output using SS/CM methods and tools. One in five, however, reported that their work group used SS/CM to produce 25% or less of their output, a finding consistent with the data collected on recentness of SS/CM adoption and the average time reported for reaching certain benchmarks for proportion of total output using SS/CM methods and tools. (Those results are reported in subsequent tables and figures.)

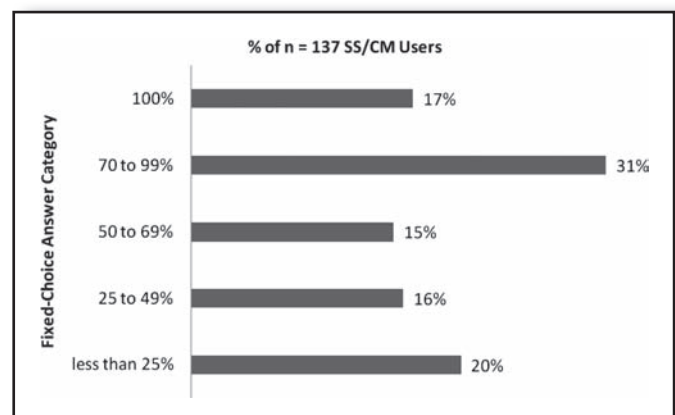


Figure 2. Proportion of Total Information Product Output Using SS/CM

About 1 in 4 Used XML and/or SGML; About 1 in 9 Used DITA

All 276 respondents answered a question asking them to identify the types of information products their work groups produced. Seventy-six (28%) checked the answer “content developed using XML or SGML.” Respondents using SS/CM ($n = 137$) were presented with another question asking them to indicate if their work group used XML and/or SGML. Figure 3 graphs the results from that question, showing that about half the SS/CM respondents produced content using XML and/or SGML. Three out of four in that group of SS/CM users indicated their work group’s system used XML alone, while most of the others indicated a system using both XML and SGML.

Another question presented to SS/CM respondents asked them to indicate which, if any, documentation standard their work group used. About 2 of 3 SS/CM respondents (64%) reported that their work group used no standard. About 1 in 5 (21%) indicated that they used DITA, and one person used both DITA and DocBook. The 30 DITA-using respondents, then, were 11% of all survey respondents, or 1 in 9.

About 1 in 10 Reported a Failed SS/CM Implementation

Twenty-four respondents (9% of $N = 276$) reported that they had been part of a work group whose

attempt to implement an SS/CM system had failed. Seven indicated that a CM system was involved, and six wrote that it was the wrong tool for their work group, citing one or more reasons. Three respondents indicated that an SS tool had failed, two saying that the SS tool had not performed to expectations and the third saying that lack of management support led to failure of the project. Fourteen respondents did not specify which type of tool was involved in the failed project, and for this subgroup no single reason for the failure predominated. Poor fit, difficulty, and cost were the main reasons cited for the failed implementations.

Almost Half the SS/CM Work Groups Had Used Their System for Two Years or Less

The survey asked those using SS/CM how long ago their work group had started using their current SS/CM system. Figure 4 shows that 45% of the SS/CM users’ work groups had been using their SS/CM system for less than two years, and 24% had been using their system for less than a year. When asked how long the work group had researched options before deciding on its SS/CM system, 103 respondents provided an estimate in months. Setting aside an outlier (40 months), the range of answers was 0 to 24 months, with a median of 4, a mean of 6.04, and a standard deviation of 6.03 (see Table 2).

The survey also asked SS/CM users to estimate how long (in months) it took their work group to reach the point of producing 25% of their information products using their SS/CM system. Estimates ($n = 97$ valid) ranged from 0 to 28 months, with a median of 4 months, a mean of 6.4, and a standard deviation of 6.25. Of the 137 respondents using SS/CM, 55% reported that their work group had completed their SS/CM implementation; 45% reported that their group was still working to complete their SS/CM implementation (however they defined that milestone, which is

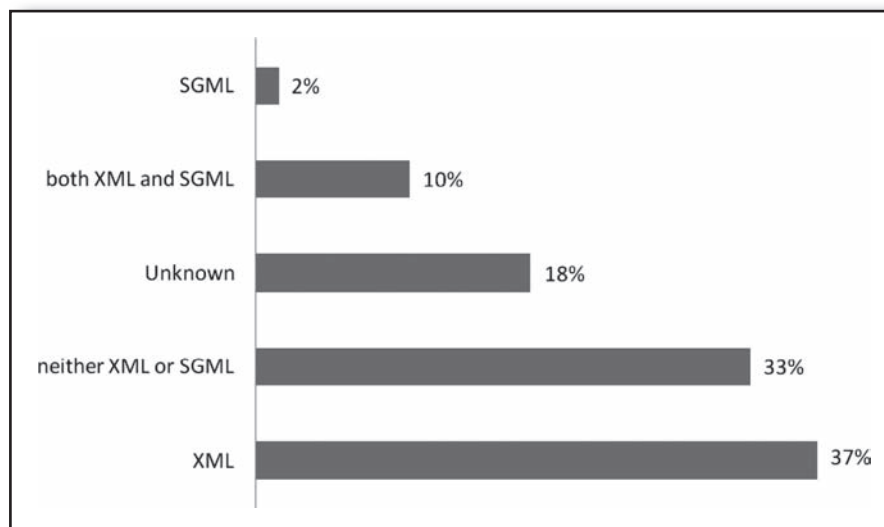


Figure 3. Use of XML and SGML by 137 SS/CM Respondents

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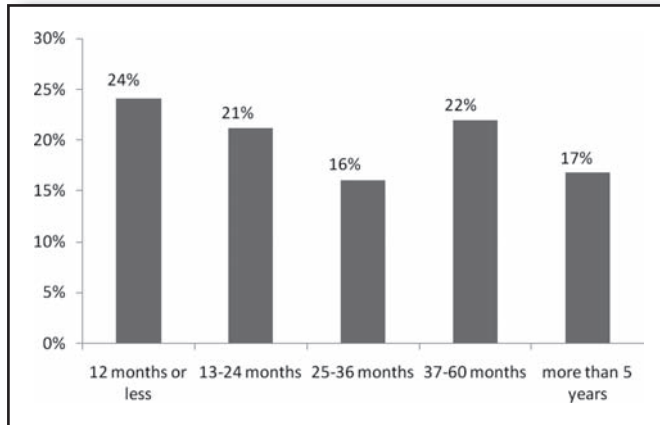


Figure 4. How Long Ago Did Work Group Begin Using SS/CM System?

not usually defined as 100% of information production output, as shown in Figure 2). Table 2 reveals that the average time it takes a work group to implement an SS/CM system seems reasonable: most work groups adopting SS/CM systems complete their implementation in well under a year. However, some work groups experience very long implementation times.

Caution must be exercised in comparing estimates by those working toward completion of SS/CM implementation with the historical estimates by those looking back at that completed milestone. For those in the “not done” group, we do not know how long SS/CM projects had been underway when they estimated how long it would be before their work group completed its implementation. With that caveat in

mind, we observe that the data in Table 2 are consistent with what we know about human nature: those looking ahead to completion of SS/CM implementation tended to see the process taking somewhat longer than those looking back in time.

SS/CM Respondents Reported Many Activities to Prepare for Transition

The survey asked SS/CM users what activities their work group engaged in to help them make the transition to SS/CM, and 83% in the SS/CM group provided answers. Figure 5 shows that SS/CM work groups engaged in a wide range of research and professional development activities to pave the way for adoption and implementation of SS/CM systems. As we would expect, about half of the work sites gathered information from vendor Web sites. The next most mentioned activity was trying out the product, which 37% said their work group did. Only slightly fewer (31%) indicated that members of their work group attended conferences and workshops to learn more about SS/CM systems. About 1 in 4 (23%) indicated that their work group hired a consultant to help them make the transition.

Top Drivers: Faster Development, Lower Costs, Regulatory and Compliance Pressures, Translation Needs

On one question, the 137 SS/CM users indicated which listed business goals influenced the decision to adopt the SS/CM system their work group used. The

Table 2. Estimated Months to Research Options, to Reach 25% Production with SS/CM, and to Complete the Implementation Process

Measures of central tendency	Months during which work group researched SS/CM options <i>n</i> = 103 valid	Months before work group produced 25% of its output with SS/CM <i>n</i> = 97 valid	Months it took to complete SS/CM implementation (historical) <i>n</i> = 56 valid	Months it will take to complete implementation (projection) <i>n</i> = 49 valid
Median 4		4	6	10.5
Mean	6.1	6.4	7.9	10.7
SD	5.96	6.25	7.07	7.95
Range	0 to 24	0 to 28	0 to 28	0 to 24

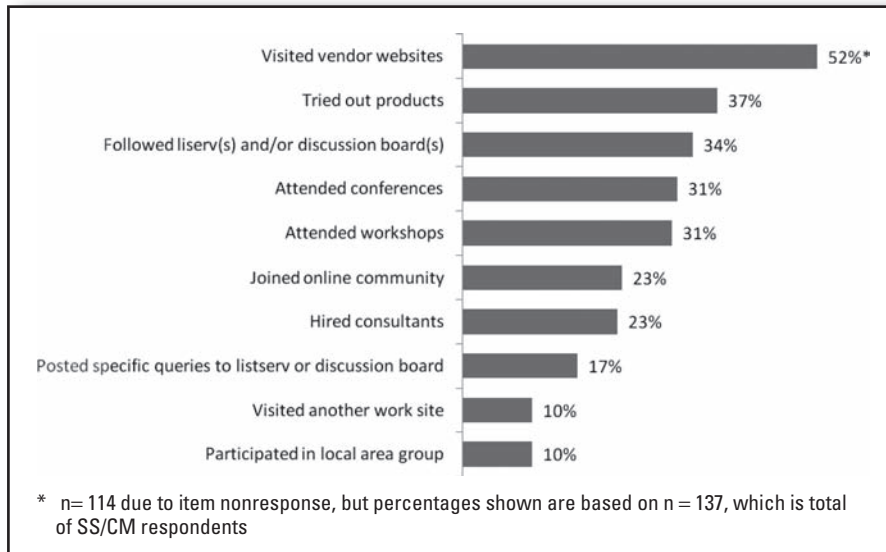


Figure 5. Transition to SS/CM Activities Reported by SS/CM Respondents

next question asked them to select the business goal that was the most important driver of the decision to adopt the SS/CM system. Figure 6 charts the results from these related questions. On the “choose all that apply” question, the business goal most often selected was providing standardization and consistency (73%). Three other business goals were indicated as influential

to regulatory or compliance pressures as the single most important driver of adoption.

SSwCM Respondents Reported Significantly Larger Work Groups

Table 3 shows that respondent work group sizes were similar for three groups: No SS or CM use; use of SS only; and use of CM only. However, the work group size reported by SSwCM users was significantly different.

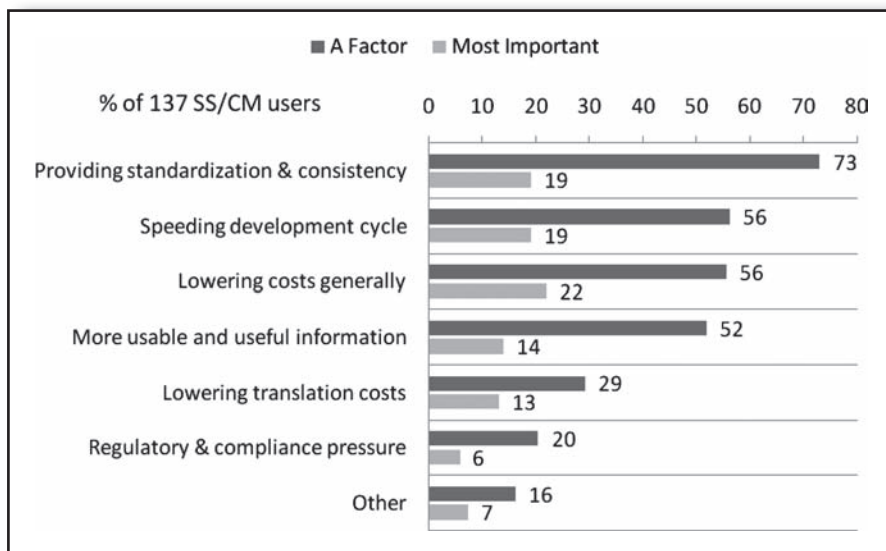


Figure 6. Business Goals Driving Decision to Implement SS/CM System

by more than half of the SS/CM group: speeding up development (57%), lowering costs (56%), and providing more usable and useful information products (52%).

In identifying the single most important business goal driving the decision to adopt the SS/CM system, about 1 in 5 respondents picked one of the first three factors listed above, with lowering costs edging out standardization and development speed as the most-picked factor. About 1 in 8 picked either lowering translation costs specifically or providing more usable and useful information products as the most important factor; only 6% chose responding

SS/CM and Non-use Groups Varied Significantly by Company Size

Knowing that larger work group sizes predict a significantly greater likelihood of using SS/CM methods and tools, we would expect the same to hold true, generally, for the association between company size and likelihood of using SS/CM. That is the case, though the association is not as strong as work group size. Chi square analysis revealed that the proportions shown in Table 4 are significantly different,

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Table 3. SSwCM Users Reported Significantly Larger Work Group Sizes*

Measures of central tendency	No SS/CM <i>n</i> = 137	SS only <i>n</i> = 46	CM only <i>n</i> = 33	SS with CM (SSwCM) <i>n</i> = 53
Median 4.00		5.00	5.00	12.00
Mean	6.91	8.24	9.45	18.00*
SD	9.919	11.478	11.869	17.747
Range	1 to 75	1 to 70	1 to 50	1 to 65

* The null hypothesis that differences in work group size are due to chance was rejected: A one-way Welch's variance-weighted ANOVA was used to test for differences among the group sizes reported by respondents in the four categories, and these were found to differ significantly $F(3, 86.8) = 6.19, p = .001$. Tamhane post hoc comparisons of the four groups show that work sizes reported by those in the SSwCM category ($M = 18.0$) differ significantly from those of the No SS or CM category ($M = 9.91, p = .000$); those of the SS only category ($M = 8.24, p = .009$); and those of the CM only category ($M = 9.45, p = .053$).

$\chi^2(9, N = 275) = 25.283, p = .003$. Somers' d , used to test the strength of significant chi square associations for ordinal by ordinal data, had a value of .17, which is noteworthy, though weak. (In other words, knowing the size of a respondent's company reduces prediction errors about which SS/CM subgroup the respondent is in by 17%.)

SS/CM Was Significantly Associated with Greater Translation Needs

A question presented to all respondents asked, "Regarding your work group's information products: Into how many languages are some or all of those products translated?" Table 5 sorts the answers into the four categories formed by the fixed choices, which ranged from 0 languages to 10 or more languages. Chi square analysis revealed that the proportions shown in Table 5 are significantly different, $\chi^2(9, N = 276) = 34.563, p = .000$. Goodman and Kruskal's tau, a proportional reduction in error directional measure of association for nominal by nominal data, was 0.51 with the SS/CM category as the dependent variable. (Knowing the number of languages for translation reduces errors in predicting the SS/CM category by half.) These results strongly support the perception among many technical communicators that translation needs are often a critically important factor in justifying the costs of moving to SS and/or SSwCM systems.

SS/CM Groups Differed Significantly on Some Likert-type Items About Impacts

The survey presented the SS/CM users with a series of 10 Likert-type items about perceived impacts of

Table 4. SS/CM Use Categories Cross-Tabulated with Company Size Categories

Category of SS/CM Use		1-99	100-999	1,000-9,999	10,000 or more	Totals
No SS / CM	Count	42	42	25	30	139
	% within category	30%	30%	18%	22%	100%
SS only	Count	13	18	9	7	47
	% within category	28%	38%	19%	15%	100%
CM only	Count	8	7	7	13	35
	% within category	23%	20%	20%	37%	100%
SSwCM	Count	5	10	20	19	54
	% within category	9%	19%	37%	35%	100%
Total	Count	68	77	61	69	275
	% within category	25%	28%	22%	25%	100%

* Null hypothesis that differences in proportions across columns are due to chance was rejected: $\chi^2(9, N = 275) = 25.283, p = .003$; Somers' $d = .172$

Table 5. SS/CM Category Cross Tabulated with Number of Languages Translated*

		Number of Languages for Translations				
		0	1–4	5–9	10 or +	Total
No SS or CM	Count	72	50	8	9	139
	% within category	52%	36%	6%	7%	100%
SS only	Count	22	10	6	9	47
	% within category	47%	21%	13%	19%	100%
CM only	Count	16	14	3	2	35
	% within category	46%	40%	9%	6%	100%
SSwCM	Count	14	15	10	16	55
	% within category	26%	27%	18%	29%	100%
Total	Count	124	89	27	36	276
	% within category	45%	32%	10%	13%	100%

* Null hypothesis that differences in proportions across columns are due to chance was rejected: χ^2 (9, $N = 276$) = 34.563, $p = .000$.

using SS/CM. These 137 respondents picked an answer on a five-point scale ranging from strongly disagree (value of 1) to strongly agree (value of 5). The mean ratings elicited by the 10 statements are shown in Figure 7. Pairwise comparison using the Kruskal-Wallis non-parametric test of independent groups showed significant differences between groups, which are footnoted in Figure 7. These statistically significant differences can be summed up as follows:

- Respondents whose work groups used single sourcing without content management (SS) agreed more strongly that their system “has helped speed up development of information products” than respondents from the other two groups—content management without single sourcing (CM) and single sourcing with content management (SSwCM).
- CM respondents agreed less strongly than respondents from the other two groups that their system “has helped speed up development of information products.”
- SS respondents more strongly agreed than SSwCM respondents that their system “has made our routine work less stressful overall.”

- SSwCM respondents more strongly agreed than respondents using SS only or CM only that their system “has improved the usability of our information products.”

Half the SS/CM Users Reported Significant Downsides or Tradeoffs

The survey asked those using SS/CM systems, “Has your work group and/or company experienced any significant downsides or tradeoffs resulting from switching to its SS/CM system?” Seventy-two of the 137 respondents (53%) answered “Yes” and also typed comments into a text-entry space. We did an initial coding of the comments and then further reduced the categories with a second round of coding, which produced the results shown in Table 6. Table 7 contains a representative sample of the comments in each of the top six categories.

One in Four SS/CM Users Said That Their Work Group was Considering a Change in Tools

Thirty-nine or 28% of the SS/CM users indicated that their work group was considering a change to a different SS/CM system. In an open-ended follow-up question, 26 respondents mentioned specific tools

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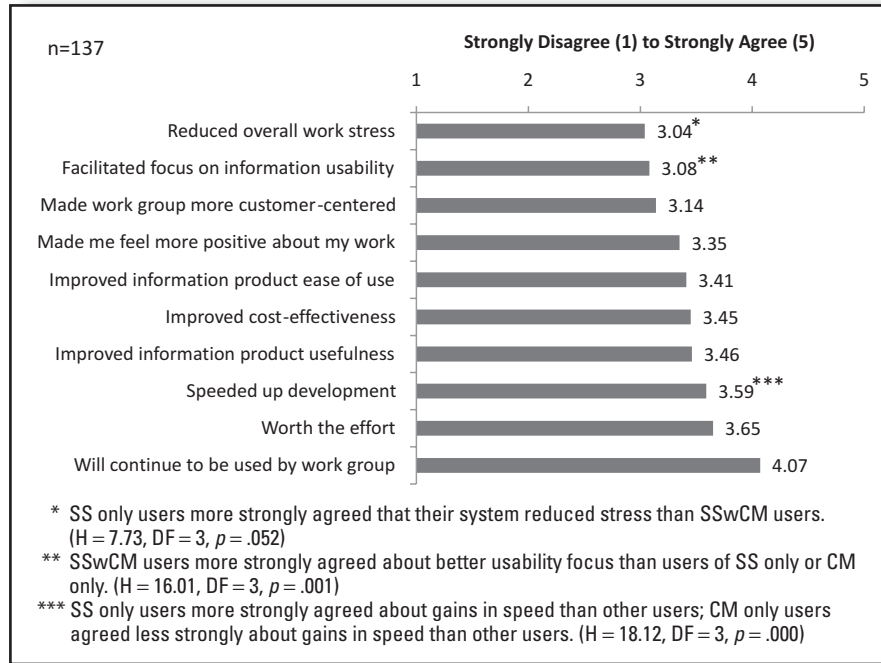


Figure 7. Mean Rating of SS/CM Users on 10 Likert-Type Statements About SS/CM Impacts

under consideration. DITA was mentioned in nine responses; other tools mentioned more than one time were Structured FrameMaker (5 times), MadCap Flare (4), SharePoint (3), RoboHelp (2), and XMetal (2).

Table 6. Comments on Downsides of SS/CM Implementation: Count by Category

Category into which comment was sorted	n = 72	% of 137
Awkward production/slower production/more work for writers	23	17
Difficult or slow transition/learning curve/team member resistance	22	16
Bugs and technical glitches	13	10
Lack of ability to customize	5	4
Expense	3	2
Garbage in, garbage out	3	2
Technical skills demands; loss of process control; too early to tell	1 each	1

Half of the No-SS/CM Work Groups Had Considered SS/CM, but Few Planned to Adopt

In addition, about 1 in 3 reported that their work group had never considered switching to SS/CM, and about 1 in 10 were not sure or gave ambiguous explanations after checking "Other." For 66 respondents (47%) in the no-SS/CM group who answered a follow-up question about factors driving their work group to consider using SS/CM, the most important factors were speeding up development (71% of $n = 66$), providing standardization and consistency (68%), and cutting costs (61%). These results are similar to those from SS/CM respondents (see Figure 6).

The 66 non-SS/CM respondents reporting that their work groups had considered SS/CM were asked to explain what their group had concluded about the feasibility of adopting SS/CM. About half these respondents mentioned as obstacles the money, time, and/or resources required to move forward with a transition to SS/CM. About 1 in 5 indicated that their work group or management concluded that SS/CM was not practical for them or not needed. Another 1 in 5 indicated that no decision had yet been made about the feasibility of switching to SS/CM.

Respondents Reported Producing a Diverse Array of Information Products

All respondents were presented with a long list of information products and checked all the ones their work group produced (see Table 8). Not surprisingly, PDF files and technical content documents were the top categories, selected by 9 out of 10 respondents. About 3 out of 4 said their work groups produced Microsoft Word files and/or content with screen shots. Two other types of products were selected by over half the respondents: HTML-based help content and instructional content. Far fewer respondents indicated their work groups produced multimedia

Table 7. Sample Comments on Downsides of SS/CM Implementation, for Top Six Categories from Table 6

<i>Awkward production / slower production / more work for writers</i>	<ul style="list-style-type: none"> • What was promised was not delivered. Gained little, but cause huge hits on our resources to get it implemented and clean up the database. Network connectivity was a big problem for our global company. The CM turned out to be a very expensive storage system with none of the benefits of single sourcing. • We did a rapid implementation of the CMS and it remains incomplete. Workflows, content delivery, and providing access to the content for groups outside our department remain huge challenges. • Extensive overhead involved in creating topics, conrefs, maps, etc. • More churn, fewer people able to produce an entire doc product without large external bottlenecks and dependencies. • My understanding is that SS/CM was for translation. It has burdened the writers, because we do more of the upfront translation work. It has benefitted translation and not the writers.
<i>Difficult or slow transition / learning curve / team member resistance</i>	<ul style="list-style-type: none"> • The time it is taking to switch to DITA and re-train and re-tool the entire department is significant. • Political battles over product selection, disagreement over content submission form and workflow design, overall cost, cost recovery issues, maintaining stability of production environment as implementation requirements escalate over time, and technical implementation nightmares have severely hampered implementation. • Big learning curve, tool knowledge all in one part of the team that is physically far from the rest, almost complete change in team members in past two years, so newbies with no buy-in for the tool, unable to implement the tool in the way team members wanted. • There's also been a social cost—an “us-against-them” mentality has developed between the “not getting it” writers and the staff who understand the tools and techniques. The “not getting it” crowd feels that the SS/CM implementers are imposing on them, and the implementers are losing patience with the “not getting it” bunch. I shudder to think what will happen when we migrate to structure!
<i>Bugs and technical glitches</i>	<ul style="list-style-type: none"> • A few software bugs and gremlins. Not very significant, but present. • [Product] is buggy especially when having to reinstall after a system crash. Ugh! • The software is overly customized and the CM is somewhat unstable. We're upgrading/switching soon.
<i>Lack of ability to customize</i>	<ul style="list-style-type: none"> • Customers tend to want to edit and use source files, but they cannot do that without the same licenses and style sheets our group uses, and most of them are not willing to invest the time. • Need to use existing templates, which don't always fit our needs.
<i>Expense</i>	<ul style="list-style-type: none"> • The product was expensive.
<i>Garbage in, garbage out</i>	<ul style="list-style-type: none"> • Initial data entry was a problem, as we just converted our old stuff into the new, even when it was bad. Ended up with a big database with bad information.

and/or interactive content, such as videos, animation, simulations, and interactive Flash or Shockwave content.

We intended for the product categories to overlap and to represent as broad a spectrum of information products as possible, but respondents could add other types in an open-ended “other” follow up question. We examined the 29 responses to the “other” question and identified 12 responses representing types of information

products not already checked by the respondent, such as reports, proposals, forms, posters, and so forth.

Microsoft Word Was the Most-used Primary Authoring Tool

All 276 respondents answered this question by typing into a text-entry box: “What is your work group's primary tool for textual content authoring/editing?”

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Table 8. Types of Information Products Reported by All Respondents

%	Information Products	N = 276
91	PDF files	252
91	Technical content documents	252
79	Content with screen shots	217
72	Microsoft Word files	200
57	Help content (HTML Help, Web Help, etc.)	157
56	Instructional content	156
46	Content with technical diagrams or illustrations	126
42	Other Web page-delivered content	117
28	XML or SGML content	76
27	e-learning content	75
24	Knowledgebase topics	65
24	Video or animation content	65
18	Software demonstrations or simulations	50
17	Flash Player interactive content	47
14	Content with 3D models	39
5	Content for mobile devices	15
5	Shockwave Player interactive content	15
4	Miscellaneous other not counted in above	12

Table 9. Primary Authoring/Editing Tool

%	Tool	N = 276
46	Microsoft Word	127
30	Adobe FrameMaker	83
4	Arbortext Editor (Epic Editor)	12
3	Adobe RoboHelp	9
3	Author-it	8
2	XMetaL	7
2	Adobe InDesign	5
1	XML	3
1	MadCap Flare	2
7	Misc. other	19

Naturally, we had to categorize the answers, shown in Table 9. About 1 in 2 respondents (46%) identified Microsoft Word as their work group's primary authoring/editing tool. Approximately 1 in 3 (30%) named Adobe FrameMaker. The remaining quarter of the respondents listed a variety of tools, including Arbortext Editor (4%), RoboHelp (3%), Author-it (3%), XMetaL (2%), and InDesign (2%).

Conclusions

The survey results summarized above provide a snapshot—taken in May 2008—depicting STC members' use of single sourcing and content management methods and tools. These results are the first publicly available data from a random sample survey on this topic. In this section, we discuss the most important conclusions to be drawn from the data.

Has Single Sourcing and/or Content Management Reached a Critical Mass?

Everett M. Rogers (1995) depicted the rate of adoption for any given innovation as a normal, bell-shaped curve and designated categories of adopters—from early adopters to laggards—based on their postulated time-to-adopt relative to the average time for all potential adopters (see Figure 8). Rogers further postulated that a “critical mass” had to adopt an innovation before it could “take off”—reaching what popular author Malcolm Gladwell (2000) famously termed “the tipping point.”

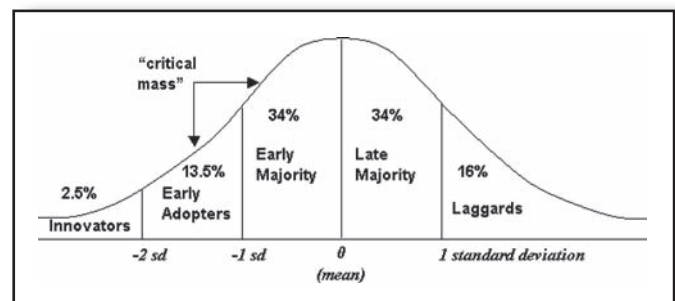


Figure 8. Rogers's Innovation Adopter Categories Depicted as Normal Distribution of Time-to-Adoption (Rogers, 1995, p. 262)

If all varieties of SS/CM are considered together as the innovation, the answer about critical mass is a confident *yes*: half of our respondents reported using SS, CM, or SSwCM. In addition, as shown by the data on how long groups had been using their SS/CM system (see Figure 4), the pace of adoption of all three categories of SS/CM had picked up somewhat during the 2 years prior to the survey—from about mid-2006 to mid-2008. The current recession began in December 2007 (National Bureau of Economic Research, 2008). Undoubtedly, the recession has put a damper on the spread of SS/CM among technical communication work groups over the past 2 years. We think it is likely, however, that the recession may have had less impact on the adoption of SS systems, which generally have a lower price tag, than on the more expensive SSwCM systems.

If we regard each set of SS/CM methods and tools as a distinct innovation competing with the others, then our answer about critical mass, based on the Figure 1 data, becomes *maybe* for SS only and for SSwCM: Those methods and tools appear to have reached a critical mass of adopters. However, the results suggest that CM without single sourcing did not seem destined for widespread adoption in technical communication. In sum, our survey shows that as of mid-2008 STC members had moved into the Early Majority phase (Figure 8) for SS only and SSwCM, but CM by itself was still in the Early Adopter phase. Likewise, with regard to XML adoption, STC members were in the Early Majority phase, but for DITA they were in the Early Adopter phase (see Figure 3 and related explanatory text).

Are Larger Companies More Likely to Use SS/CM?

Yes—see Table 4—but the strength of the statistically significant association is weaker than some would predict. We found a stronger association between work-group size and likelihood of using SS/CM. And, of course, we come back to the problem of conflating all types of SS/CM methods and tools: The cost of adoption in time and money will vary widely depending on the specific solution adopted, adapted, and/or developed. Some SSwCM systems are expensive, and only companies with deep pockets can afford them. On the other hand, a small work group with one or two technically savvy and resourceful

members could develop an SS-only or even an SSwCM system with relatively low-cost and/or open-source tools.

Are Translation Requirements a Big Driver of SS/CM Adoption?

Absolutely, yes: See Table 5. Our data support what anyone would have assumed who has followed this topic at STC conferences. However, translation is not the top driver of SS/CM adoption, as demonstrated in Figure 6, which shows that three business goals were picked about evenly as the most important driver of the decision to adopt an SS/CM system: Lowering costs generally, speeding up development, and providing standardization or improving consistency.

What Are the Biggest Surprises in the Survey Results?

For us, the biggest surprise was that only 1 in 10 respondents reported that they had been involved in a work group whose attempt to implement an SS/CM system had failed. On more than one occasion, one of us (Dayton) has heard prominent consultants at STC conferences estimate failure rates for SS/CM projects at 50% and higher. We think the data from our survey probably underestimates the actual failure rate for such projects, but we also suspect that these results mean that failure rates are commonly overestimated. This may be explained by different notions of what constitutes a failed project. Half of our survey's respondents who reported no SS/CM use also reported that their work group had considered a switch to SS/CM but had no plans to move in that direction. This suggests that many work groups investigate SS/CM options, including contacting consultants, but end up deciding to stay with the methods and tools they have, often without trying to implement an SS/CM system. To a consultant, that may count as a failure to implement, but to insiders it may simply be a successful conclusion to a deliberative process focused on feasibility.

Another surprise was that 1 in 4 respondents in work groups using SS/CM was considering a change in methods and tools and that 1 in 2 reported significant downsides to their current SS/CM methods and tools. We did not expect that high a level of dissatisfaction with SS/CM methods and tools; on the other hand, we

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did not ask non-users of SS/CM a similar question about perceived downsides of their methods and tools.

What Else in the Results Deserves to Be Highlighted?

Microsoft Word and FrameMaker were by far the most-used primary authoring tools of the survey respondents, and more than three times as many respondents produced PDF files as produced content using XML or SGML.

We also think that the data on the Likert-type agreement-disagreement items are intriguing: SS-only respondents were significantly more in agreement that their system had speeded up their work while reducing their work-related stress. SSwCM respondents, however, were significantly more in agreement that their system had made work groups more focused on information usability issues. These results tempt us to speculate that the added complexity of implementing single sourcing through a content management system adversely impacts perceptions of overall efficiency and stressfulness while bolstering perceptions that the work group is giving more attention to the usability of its information products. Perhaps implementing SSwCM is more likely to compel work groups to re-invent their information development processes, leading to more user-centered analysis and testing of their information products.

Is It Likely That This Survey Underestimates Use of SS/CM by STC Members?

For surveys of the general public, textbooks about social science research instruct that a low response rate, commonly specified as below 50% (Babbie, 2007, p. 262), warrants caution in assuming that data from the survey accurately represent the results that would be produced if data could be gathered from all members of the represented group. Our survey's response rate of 28% must be viewed as a limitation of the study: Because we lack information about the nonrespondents to the survey, we cannot know whether they, as a group, differ significantly from respondents in regard to the topics covered by the survey. The discussion about how likely it is that the survey's results accurately represent the experiences and attitudes of STC members in 2008 must be grounded in logical imputation.

We do not think the results underestimate STC members' use of single sourcing and content management in the spring of 2008. Indeed, we think that

it seems just as likely that the survey overestimates SS and CM use by STC members. We make that argument in Appendix B, for those who may be interested in a review and discussion of research supporting the proposition that low survey response rates do not automatically mean questionable data quality. Our examination of the literature on that topic has bolstered our confidence that our survey presents a reasonably accurate snapshot of STC members' experiences and opinions related to single sourcing and content management.

From the Survey Results, What Dare We Predict About the Future of SS/CM?

The survey results make for a rather cloudy crystal ball. Nevertheless, adding them to what we know from half a decade of following the information about SS/CM disseminated in the publications and at the conferences of technical communication practitioners and academics, we feel confident in making these general predictions:

- Single sourcing will slowly but steadily gain wider acceptance among technical communication workgroups. Single sourcing seems destined to reach a significantly larger proportion of adopters than single sourcing with content management—barring a technological breakthrough that makes SSwCM systems significantly cheaper and easier to install, use, and maintain. Perhaps, though, one or more popular SS tools such as Adobe FrameMaker and MadCap Flare will evolve into true SSwCM solutions, altering the SS/CM marketplace quite dramatically.
- Pushing XML-enabled single sourcing to the tipping point may take the arrival, or the more effective marketing, of user-friendly and affordable plug-in tools for Microsoft Word, which was by far the most-used authoring tool of STC members in May 2008.
- The number of eventual SS/CM adopters in technical communication may be somewhat lower than SS/CM vendors and consultants anticipate. Already, Web 2.0 and social media/networking methods and tools are stealing the spotlight from SS/CM topics at the leading conferences attended by technical communicators.

That last conjecture seems a suitably provocative note to end on. Standardized structure and control are at the heart of the SS/CM paradigm, but those qualities are anathema to the Web 2.0/social networking paradigm.

What's going on here? Could it be that many companies find today that they need technical communicators to produce a continuous stream of just-in-time, variously structured, often transient, multimedia content—as much or more than they need them to produce highly regulated and uniform topics in a database whose information, as well as its meta-information, is composed almost entirely of words?

This question, in simpler forms, will become the focus of much discussion among technical communicators. It represents only one of several obvious directions for further research related to the incessant search for better, cheaper, and faster ways of creating useful and usable technical information products.

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Appendix A: An Annotated Bibliography

Because our survey was about methods and tools that have been much discussed in conferences and the literature of the field for over a decade, we did not begin our report with an introductory literature

review—the conventional way of justifying a new study and showing its relation to prior research and theory. Instead, we provide this brief annotated bibliography. We selected these sources as recent and useful starting points for delving into the abundant literature by technical communicators discussing single sourcing and content management.

Dayton, D. (2006). A hybrid analytical framework to guide studies of innovative IT adoption by work groups. *Technical Communication Quarterly*, 15, 355–382.

This article reports a case study of a medium-sized company that carried out a user-centered design process, complete with empirical audience research and usability tests, to put all its technical reference, troubleshooting, training, and user assistance information into a single-source, database-driven content management system. The case study is interpreted through the lens of a hybrid analytical framework that combines and aligns three distinct theoretical traditions that have been used to guide technology adoption and diffusion studies.

Dayton, D. (2007). Prospectus for a multimodal study of single sourcing and content management. In *IPCC 2007: Engineering the future of human communication*. Proceedings of the 2007 IEEE International Professional Communication Conference (IPCC) held in Seattle, Washington, Oct. 1–3, 2007. Piscataway, NJ: IEEE.

This proceedings paper describes the research project funded by STC in 2007, of which the survey reported in our article is the major part. It contains a justification for the focus of the study based in a traditional review of the literature.

Kastman Breuch, L. (2008). A work in process: A study of single-source documentation and document review processes of cardiac devices. *Technical Communication*, 55, 343–356.

This article from the STC journal documents a case study with details on implementation and impacts that offer a healthy practical counterpoint to the more abstract and theoretical perspectives that dominate the chapters in the Pullman and Gu collection. Kastman Breuch is particularly interested to explore the impacts

of single sourcing (implemented through a content management system) on the document review process: “Both of these practices influence the roles and identities of technical writers as individual authors. What happens when we examine the impact of both practices—document review processes and single sourcing—together?” (p. 345).

Pullman, G., & Gu, B. (Eds.). (2008). *Content management: bridging the gap between theory and practice*. Amityville, NY: Baywood Pub. Co.

A collection of 11 articles originally published in a special issue of *Technical Communication Quarterly*, this book will appeal primarily to those seeking an in-depth, critical exploration of content management systems. The book’s editors define CM broadly, and none of the chapters specifically focus on single sourcing. An online copy of the book’s introduction is available at the publisher’s Web site: <http://www.baywood.com/intro/378-9.pdf>.

Rockley, A. (2001). The impact of single sourcing and technology. *Technical Communication*, 48, 189–193.

This article in the STC’s journal was the first to propose a comprehensive scheme for defining types of single sourcing. Rockley described four distinct levels of single sourcing, with level 2 corresponding to what we have defined as single sourcing without content management. Level 3 corresponds to what we have defined as content management: “Information is drawn from a database, not from static, pre-built files of information” (p. 191). Rockley equates level 4 with advanced electronic performance support systems that are not practical to implement in most user-assistance scenarios.

Williams, J. D. (2003). The implications of single sourcing for technical communicators. *Technical Communication*, 50, 321–327.

This article by a practicing technical communicator provides an excellent starting point for readers new to the topic of single sourcing. Williams provides concise but comprehensive summaries of key articles and books from 2000 to 2003 and provides a well-selected further reading list that includes articles from 1995 to 2002.

Appendix B: New Thinking About Survey Response Rates

Researchers have recently called into question whether a survey response rate of 60% to 70% should be considered, by itself, to ensure that the results are more trustworthy than those from a survey with a much lower response rate (Curtin, Presser, & Singer, 2000; Keeter et al., 2000; Merkle & Edelman, 2002). Groves, Presser, and Dipko (2004) sum up the challenge to the conventional wisdom on response rates: “While a low survey response rate may indicate that the risk of nonresponse error is high, we know little about when nonresponse causes such error and when nonresponse is ignorable” (p. 2).

“Emerging research,” Radwin wrote (2009), “shows that despite all the hand-wringing about survey nonresponse, the actual effect of response rate on survey accuracy is generally small and inconsistent, and in any case it is less consequential than many other serious but often ignored sources of bias” (para. 4). Radwin cites a study by Visser, Krosnick, Marquette, and Curtin (1996) that compared the pre-election results of mail surveys conducted from 1980 through 1994 with the results of parallel telephone surveys conducted in the same years. The average response rate of the mail surveys was 25% while the telephone surveys reported estimated response rates of 60% to 70%. Based on response rate alone, conventional wisdom would predict that the telephone surveys were significantly more accurate than the mail surveys, but the opposite was the case. The mail surveys consistently outperformed the telephone surveys on accuracy. Visser et al. concluded that “to view a high response rate as a necessary condition for accuracy is not necessarily sensible, nor is the notion that a low response rate necessarily means low accuracy” (p. 216).

We believe that what Visser et al. (1996) found to be true of surveys of the electorate is even more likely to hold true for surveys such as ours whose sampling frame is confined to the members of a professional organization. Almost four decades ago, Leslie (1972) noted that “when surveys are made of homogeneous populations (persons having some strong group identity) concerning their attitudes, opinions, perspectives, etc., toward issues concerning the group, significant response-rate bias

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is probably unlikely” (p. 323). In their recent meta-analysis of studies on nonresponse error in surveys, Groves and Peytcheva (2008) concluded that “the impression that membership surveys tend to suffer from unusually large nonresponse biases may be fallacious” (p. 179), even though relatively low response rates for such surveys have become a well-known problem.

Rogelberg et al. (2003) stress the self-evident point, often forgotten in discussions on this topic, that survey nonresponse is not the same as survey noncompliance—the purposeful refusal to take a survey. If a sizable number of our e-mailed survey invitations never reached the intended recipients, because of spam blockers, for example, or filters created by recipients to delete e-mails from certain senders, then the actual response rate would be higher—though by how much is impossible to say. Similarly, it is impossible to know how many times the e-mails about the survey may have been deleted automatically by recipients who did not make a conscious decision to refuse the invitation to take the survey. During May 2008, along with our survey invitation STC sent out multiple e-mails to members about the upcoming annual conference. Many members in the sample may have paid scant attention to our initial e-mails about the survey because the first identified *stc@stc.org* as the sender. (We had the STC staff member change the sender to *ddayton@stc.org* for the two reminder e-mails.)

We believe that most of our survey’s nonrespondents were passive, not active nonrespondents. Based on their in-depth field study, Rogelberg et al. (2003) concluded that only about 15% of nonrespondents to organizational surveys were active nonrespondents, and also concluded that passive nonrespondents were identical to respondents when the survey variables had to do with attitudes toward the organization. While our survey was directed at members of an organization, the questions were not about the organization, and the type of organization is a special class—professional membership organizations. Thus, we cannot assume that the findings and reasoning reported by Rogelberg et al. (2003) apply to our nonrespondents; on the other hand, we think the question raised is one worth considering in regard to our survey: Were most nonrespondents passively passing up the chance to take our survey, or

were most of them actively rejecting the invitation because of some attitude related to the topic of the survey or attributable to some other cause that might mean that their answers on the survey would be significantly different from the answers of those who responded?

If failing to achieve a certain response rate is not automatically an indicator of nonresponse bias in a sample survey, how then can we estimate the likelihood that the survey results are biased because of missing data from the random sample? Rogelberg (2007) summed up the answer: “Bias exists when nonrespondent differences are related to standing on the survey topic of interest such that respondents and nonrespondents differ on the actual survey variables of interest” (p. 318). Translating that into plain English for the case in question, if a significant proportion of our survey’s nonrespondents were significantly different from respondents in their experience with or attitudes toward single sourcing and content management, then their missing data represents a source of bias in our survey results. Thinking about why recipients of our e-mails about the survey would purposely ignore or actively reject the invitation, we surmise that most such active nonrespondents, as opposed to the likely majority of passive nonrespondents, would have found the survey topic of little interest because they had no experience with single sourcing and/or content management systems. Even though we worded our survey invitations to stress our desire to collect information from all STC members, regardless of whether they used SS/CM methods and tools, it seems likely that many recipients of our messages who had no experience with such methods and tools would have felt disinclined to take the time to fill out the survey. To the extent that our conjecture about this is accurate, the survey results would overestimate the proportion of STC members whose work groups used SS/CM methods and tools in May 2008.

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Appendix C: Survey Documents

Link to a Non-Working Archival Copy of the Survey

<http://www.zoomerang.com/Survey/WEB22B38UWBJKZ>

Copy of Survey Notification Message from STC President Linda Oestreich

Subject: Please participate in a research study of STC members

The STC is sponsoring research to discover the range of information development methods and tools being used by STC members. We especially want to know how many members are using single sourcing and content management methods and tools.

Whether or not you use single sourcing and/or content management, we need your input. You are included in the small random sample of members who will receive an e-mail containing the link to an online questionnaire.

The survey can be done anonymously, or you can provide an e-mail address for follow-up contact or to receive an early view of the results. Most testers reported that they completed the survey in 10 to 15 minutes.

I am excited that Dr. David Dayton (PhD, Technical Communication) and Dr. Keith Hopper (PhD, Instructional Technology) have designed and tested the survey instrument and are ready to collect and analyze the data that you provide.

Look for an e-mail with a link to the survey on Tuesday, May 13.

Dr. Dayton will give a report on the survey results at a session of the 2008 Technical Communication Summit, which will be held in Philadelphia June 1–4.

Copy of First E-mail Message Containing a Link to the Survey

Subject: Please participate in a research study of STC members

Single Sourcing and Content Management

We professional technical communicators lack reliable data on the range of information development tools and technologies being used by practitioners.

The STC is sponsoring research to collect that information, with a focus on finding out what single sourcing and/or content management methods and tools are being used.

Your name was among the small random sample of members receiving this invitation to participate in an online survey accessed at this page: [typed here was a link to the informed consent Web page reproduced after this message]

The survey can be done anonymously, or you can provide an e-mail address for possible follow-up contact or to receive an early view of results. The exact set of questions presented will depend on your answers to key questions, so the time required to fill out the survey will vary. Most testers reported that they completed the survey in 10 to 15 minutes.

Whether or not you use single sourcing and/or content management, we need your input. By participating, you will help us construct a reliable profile of information development methods and tools used by STC members.

Because the random sample is a small fraction of the total STC membership, it is **critical that we have your data** in the survey results. It is equally critical that members of the sample do not forward the survey link to others.

If you have any problems with the link to the survey or with the survey itself, please contact David Dayton at ddayton@rcn.com.

David Dayton: research project lead

Towson University (Maryland)

Keith Hopper: survey deployment and statistical analysis
Southern Polytechnic State University (Georgia)

Copy of informed consent Web page giving access to the survey

Single Sourcing and Content Management in Technical Communication: A Survey of STC Members

Consent Form

Because you were included in a small random sample of STC members, your information is vital to

achieving the purpose of the survey **even if you do not use single sourcing or content management.** This consent form is required by federal regulations. By clicking the agreement link at the bottom of this form, you acknowledge that your participation is voluntary, that you may abandon the survey at any point, and that your information is anonymous unless you provide contact information, in which case we promise to handle your information with the strictest confidentiality.

Time Required

Most testers of the survey reported that it took them 10–15 minutes to fill out the questionnaire that will appear after you click on the “I agree” link at the bottom of this form.

Purpose of the Study

This survey will collect information from a sample of STC members about their use or non-use of single sourcing and content management tools and methods—and their opinions about them. (In the survey, we define precisely what we mean by “single sourcing” and “content management.”)

What You Will Do in the Study

Your only task is to fill in the Web survey itself.

Benefits

Respondents who complete the survey will be offered an early look at the preliminary data, which we will continue to analyze and will later report in conference presentations and published articles. As a technical communicator, you may benefit in that the survey data will provide a statistical snapshot of the information development methods and tools that STC members are using today and their opinions about some of those methods and tools.

Confidentiality

The information you provide **will be handled confidentially.** If you choose not to identify yourself to us, we will not try to find out who you are. You will have the option of identifying yourself for follow-up

contact by e-mail or to view the preliminary survey results.

We will present the survey findings in terms of group percentages, look for common themes in the open-ended questions, and cite remarks where they are interesting and appropriate. No individual respondents will be identified.

Risks

We do not believe there are any risks associated with participating in this survey.

Voluntary Participation and Right to Withdraw

Your participation in this study is **completely voluntary**, and you have the right to withdraw from the study at any time without penalty.

How to Withdraw from the Study

If you want to withdraw from the study, you may do so at any time simply by **closing the browser** in which this form or the questionnaire appears.

Whom to Contact About this Study or Your Rights in the Study

Principal Investigators

David Dayton, ddayton@rcn.com, Towson University (Maryland)

Keith Hopper, khopper@spsu.edu, Southern Polytechnic State University (Georgia)

Chairperson, Institutional Review Board for the Protection of Human Participants, Towson University (Maryland): Patricia Alt, palt@towson.edu

Agreement

If you agree, click here to start the survey. If you experience a problem with the link above, please copy and paste the following URL into your browser: [full Web address to the survey was typed here]

If you do not agree to participate in the survey, please close the browser now or go to the STC home page.

THIS PROJECT HAS BEEN REVIEWED BY THE INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN PARTICIPANTS AT TOWSON UNIVERSITY.

Building a Playground: General Guidelines for Creating Educational Web Sites for Children

Lisa Meloncon, Erin Haynes, Megan Varelmann, and Lisa Groh

Abstract

Purpose: Since 2004, the number of children online has increased 18%, compared with a 10% increase in total users. Not only do children represent a growing segment of Internet users, much of what they do online has a specific purpose: education. To help technical communicators create educational Web sites for children, we offer a set of guidelines to direct the design process.

Method: Nine children participated in a usability test of the CARES Playground, an educational Web site geared toward 7- to 9-year-olds. The site was designed by a group of graduate students in professional writing based on a review of the (admittedly limited) literature dealing with designing Web sites for children. This paper matches common themes from existing literature to the results of the usability tests.

Results: Since all the information on designing Web sites for children emerged from the literature of designing Web sites for adults, the themes of navigation, appearance, and content are not unfamiliar. However, the interpretation of those common issues for children—as well as the children's reaction to them—may be surprising.

Conclusion: Technical communicators need to be conscious and deliberate when designing Web sites for children. To ensure that educational Web sites are able to meet their learning goals, careful consideration of children's developmental abilities and Web preferences must be considered. We present several guidelines as a starting point, though further research is needed to confirm and expand upon them.

Keywords: children, usability, Web sites, design guidelines

Practitioner's Takeaway

- Designing Web sites for children is not the same as creating Web sites for adults.
- Technical communicators can use the following guidelines regarding navigation, appearance, and content as a starting point for the creation of educational Web sites for children.
- The guidelines presented within this paper have been empirically verified through usability testing with children ages 7 to 9, and likely present a better starting point for children of other age groups than guidelines meant for adults.
- We suggest further research in the specific areas of page length, gender, font size/type, color, sound, and age.

Introduction

Technical communicators have a vast number of resources available to them when they need help or guidance in creating Web sites. The search feature of a single online book retailer generates 29,485 hits for the keyword search “Web design.” In 2000, *Technical Communication* published a special issue containing guidelines for various aspects of Web design, including considerations such as comprehension and navigation. Technical communicators also have many heuristic tools at their disposal for assessing Web sites (Welle Donker-Kuijer, De Jong, & Lentz, 2008; Nielsen, 1994). If there is a common problem with all of these resources, however, it is the exclusive focus on adults and the adult user experience.

Children are one of the fastest growing segments of Internet users in the United States and Europe. Since 2004, the number of children online has risen 18%, compared with 10% for all users, and the increase in the number of children online outpaces the overall increase of the child population in the United States (Nielsen Wire, 2009, ¶1). In 2005, the U.S. Department of Education found that 32% of kindergarten-age children and 50% of children in first through fifth grade use the Internet (p. 2). Nielsen Wire (2009) reported that by May 2009, children ages 2 to 11 comprised nearly 16 million, or 9.5%, of the active online universe; moreover, “time spent online by this group increased 63% in the last five years” (¶2). Children’s use of the Internet also escalated in Europe. According to Eurobarometer, which monitors public opinion within the member states of the European Commission, parents of 6- to 17-year-olds reported that their children’s Internet use increased from 50% in 2006 to 75% in 2008 (Eurobarometer, 2006, p. 13; Eurobarometer, 2008, p. 5).

Not only are children a growing Internet segment, much of what children do online is educational. One United Kingdom study reported, “Two-thirds of the children think that it helps them with their learning, and one-third would like to use it for lessons if they were home sick from school” (Demner, 2001, ¶2). As such, there is potential for growth in creating educational materials and supplements for online delivery. Yet, we still do not have a robust understand of how children interact

with Web interfaces (Children Now, 2007; Hourcade, 2008; Gilutz & Black, 2010). As with existing Web design resources, the available resources for e-learning are not specifically directed toward designing for children. (See Clark & Mayer, 2008; Fee, 2009; Goodwin, 2009; and Horton, 2006 for representative books.)

So where do technical communicators turn when they are asked to create or contribute to educational Web sites for children? When faced with this exact question, we found that Web design resources specific to children are limited in number and scope, and do not address many common concerns of technical communicators. Moreover, these resources originate in fields as diverse as education, library science, cognitive science, and many more, making locating them impractical for most practicing technical communicators. Therefore, to assist technical communicators in creating educational Web sites, we recommend a set of guidelines to direct the design process. These guidelines are based on a review of the existing literature related to Web site design for children and our own usability tests of one educational Web site geared toward children.

Project Background

The children’s Web site described in this paper is part of a larger environmental health research project. For years, the rural Appalachian community of Marietta, OH, has been plagued by poor air quality. The Communities Actively Researching Exposure Study (CARES) represents a collaboration between community activist group Neighbors for Clean Air and environmental health researchers at the University of Cincinnati. The goal of the study is to determine whether air quality in the community is adversely affecting children’s health.

CARES is based on the tenets of community-based participatory research (CBPR), which has been advocated by the National Institute of Environmental Health Sciences as a better way to conduct environmental health research (O’Fallon & Dearth, 2002). What sets CBPR apart from other research frameworks is its focus on conducting research *with* a community, instead of *on* a community. Consistent with the CBPR model, the CARES project engages members of the affected community in all facets of the research,

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including the formation of the initial research question, project coordination, and collection of biological specimens.

Early in the process, CARES researchers distributed a survey to understand the community's information-seeking behavior. Results indicated that 86% of community members would search the Internet if they wanted to learn more about the risks associated with industrial air emissions in their community. Thus, the decision was made to create a Web site that would provide the community with access to research findings, educational material, and links to other reputable sources of information on environmental health and air pollution. Community members requested that a portion of the Web site be directed toward children, since they are the focus of the larger scientific study. To fund this endeavor, a Partners in Research (PIR) grant was proposed and subsequently funded. As a co-principal investigator on the PIR grant, the lead author of this article was asked to manage the development of the Web site. Since she is also a teacher and practitioner of technical communication, the children's area of the CARES Web site became a project for a graduate-level professional writing class.

Building the CARES Playground

Members of the community advisory board in Marietta provided three criteria to guide the graduate students' work on the CARES Playground, which is the children's area of the Web site. First, the Playground must feature the CARES kite logo (see Figure 1), which was created by a graphic designer in the community. Second, it needed to include basic information about air pollution and its health effects. Third, the Playground should include a list of terms and definitions associated with the scientific study (e.g., neuromotor assessment, sway, particulates). Beyond these guidelines, the

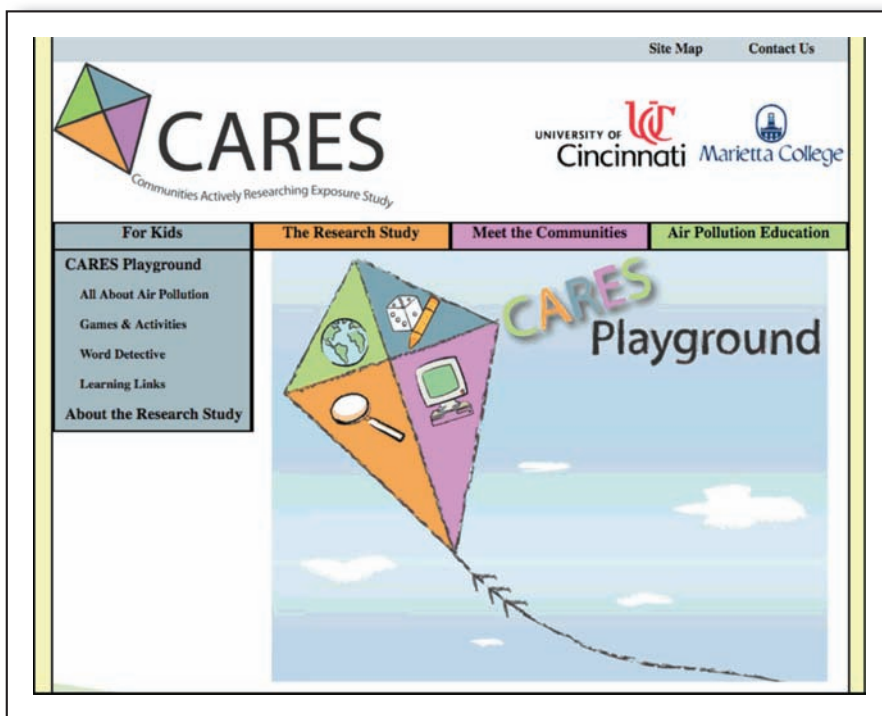


Figure 1. Launch Page for the CARES Playground

students were given free rein to conceptualize and create the entire children's portion of the CARES Web site. Because its primary purpose was to present information for teaching and learning, the CARES Playground can be classified as a limited form of e-learning, which is defined as "the use of information and computer technologies to create learning experiences" (Horton, 2006, p. 1).

E-learning comes in all shapes and sizes, from full-fledged courses to singular modules on a specific topic. According to Bruckman, Bandlow, and Forte (2008), children use online educational tools in four primary ways: as tutors, as tools, as tutees, and for computer-supported collaborative learning (CSCL). As tutors, Web pages might provide information on a subject and give a quiz to verify knowledge. As a tool, a site might allow children to input data they have collected, test hypotheses, or otherwise control the learning experience. As tutees, sites allow children to learn by doing: telling the computer what shape to display or how to move objects. In CSCL, children use computers to discuss subjects with their peers or to get information from experts (pp. 803–805). After much discussion based

on project time frames, educational goals for the site, and available technologies, the graduate students chose to limit the CARES Playground to the role of tutor.

In the beginning stages of planning the Web site, the students did what most practitioners would do when faced with a new and unfamiliar task: they researched. Their research focused on three specific areas: children's developmental theory, Web design guidelines specifically for children, and basic ideas from e-learning theories.

Children's Developmental Theory

Most theories of child development start with Jean Piaget (1970) and his concept of the four stages of physical and mental development: sensorimotor, pre-operational, concrete operational, and formal operational. The target age group for the CARES Playground falls within the concrete operational stage. According to Butterworth and Harris (1994, pp. 183–190), when it comes to interacting with a Web site, children in this stage are able to:

- Control and use a mouse
- Read more complete and complex texts
- Interact with peers based on a strong group identity
- Think logically (though they still rely on concrete references)
- Have limited sense of relationships in space and time
- Classify and order objects
- Begin to associate and transfer personal knowledge and experience to a particular situation

Even though Piaget's theories have received considerable positive and negative attention, his basic premises give Web designers and technical communicators a foundation for understanding how children perceive, process, and act on information. The specific abilities of children in the concrete operational stage reinforce the fact that "[f]ive- to eight-year-old users have needs and preferences that differ from that of other user groups" (Gelderblom & Kotzé, 2009, p. 52). In that case, technical communicators need Web site guidelines specifically for children, as the application of existing guidelines for adults to children's contexts is an inferior solution.

Web Design Guidelines for Children

Although the graduate students had expected to encounter the problem of too much information about designing Web sites for children, the exact opposite was true. Few published resources exist that are specific to children. If organizations have completed user tests with children, they have kept those results proprietary, forcing technical communicators designing Web sites for children to rely on best guesses, research geared specifically to adults, or limited studies with little support for evidence. Thus, the graduate students used basic adult guidelines, such as those published in *Technical Communication* in 2000 (Van der Geest & Spyridakis, 2000) and Krug's (2006) *Don't Make Me Think*, to supplement the few available resources about designing Web sites for children (e.g., Bruckman et al., 2008; European Telecommunications Standards Institute, 2005, pp. 21–24; Harrison, Zappen, & Watson, 2009; Nielsen & Gilutz, 2002; Rose, Rose, & Blodgett, 2009). Due to the underlying assumption that the site would be used with adult guidance and/or supervision, most likely in a classroom setting, the literature on mechanisms to control for online safety or to mitigate risks was not considered (Clarke, 2006; European Telecommunications Standards Institute, 2005; Izenberg & Lieberman, 1998).

An important distinction also needs to be made between educational supplements and the more commonly discussed Internet educational portals. Portals, such as Infoplease or Yahoo! Kids, are information-seeking interfaces designed to help children locate answers to homework questions or to find information to include in a specific assignment like a book report. Since the aims of portals are different than those of educational supplements, the approach to design is different as well. Indeed, the conditions under which children use portals make information-seeking less relevant to the design of an educational supplement (although we acknowledge there is considerable overlap). Because of this disconnect and because the goal of the CARES Playground was to function as an educational supplement that would be successfully used in a classroom setting, the growing body of research on Web portals is not fully considered here (Bilal, 2001; Large & Beheshti, 2005; Large, Besheti, & Rahman, 2002; Large, Beheshti, Nasset, & Bowler, 2004; Large, Beheshti, Nasset, & Bowler, 2006; Naidu, 2005).

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E-learning Theories

For children, most e-learning occurs in small doses in computer labs or during homework assignments. Much of the scholarship on e-learning for children concerns learning outcomes rather than interface design (e.g., Nokelainen, 2006; Wrzesien & Raya, 2010). However, more general overviews of e-learning, such as Clark and Mayer's (2008) *E-Learning and the Science of Instruction* and Horton's (2006) *E-Learning by Design* proved to be helpful in the design of the CARES Playground. In particular, a study by educational technology specialists Harbeck and Sherman (1999) identifies seven principles to help children achieve learning objectives through "developmentally appropriate practice" (p. 40); these principles effectively "summarize the concerns developers should address as they design Web pages for young children" (p. 41). This research served as the basis for a short list of guidelines specific to designing Web sites for children, enabling the graduate students to build the first prototype of the CARES Playground.

Testing the CARES Playground

As the graduate students were creating the Web site, they knew that children in the affected community would test the final product. However, current thinking in designing for children advocates involving them in the initial phases of a site's development, rather than waiting until the project is near completion (Bilal, 2001; Bruckman et al., 2008; Demner, 2001; Druin, 1999 and 2002). Since Marietta is 4 hours away from the University of Cincinnati, it was not feasible to include children from Marietta in a preliminary usability test. Instead, the graduate students recruited three children from the Cincinnati area for a usability test based on a task and read-aloud protocol. To guide their further development of the site, the students sought feedback from the children in three main categories:

- Basic navigational structure: Could children understand and follow the site's navigation?
- Design: Did children find the colors, images, and overall atmosphere interesting?
- Content: Could children understand the information presented by the site?

Since the preliminary usability test was the last requirement for the graduate course, the lead author made changes to the CARES Playground and conducted the subsequent usability tests.

To extend the tenets of CBPR back to the affected community, we recruited 10 children, ages 7 to 9, for a usability test approved by the University of Cincinnati's Institutional Review Board. All of the children had previously participated in the CARES project, and the usability test was conducted at the same local university where prior CARES testing had taken place. The usability test was conducted in a typical computer lab (consisting of long rows of computer terminals facing forward) similar to most computer labs in elementary schools. Of the 10 children scheduled for the user test, nine completed the test: five boys and four girls. (One child did not show up.) By having the children complete the test in two sessions, each lasting roughly 45 minutes, we were able to maintain the recommended 1:1 or 1:2 child-to-evaluator ratio (Druin, 1999). Five children attended the first session; four attended the second session. We found the maximum of five users per session to be manageable when working with children.

Before the test began, we collected written consent from the parents and assent from the children. After completing consent forms, parents were asked to wait in a separate room. This allowed us to more closely simulate actual conditions for use, which typically would not involve parents. We then collected brief background information from the children regarding their typical use of the Internet, and found that eight of the nine children had a computer at home but only three used it every day. All of the children reported that they used computers at school a "few" times a week. After the children were given a brief overview of the usability test's aims, they were asked a series of questions designed to gauge their opinions of the CARES Playground. While the formal usability test followed many of the same guidelines as the preliminary test, it was much more structured. Formulated in advance, the questions prompted the children to provide specific feedback in terms of design, navigation, length of text, and age-appropriateness of the revised content. (Based on the results of the preliminary usability test, we already knew that the site was functional in terms of learning

outcomes.) The formal usability tests relied on an active intervention protocol to elicit feedback. Active intervention “is based on the principle that children are asked to answer questions posed by the evaluator during task performance” (Van Kesteren, Bekker, Vermeeren, & Loyd, 2003, p. 42). The children were paid \$25 for taking part in the test and were surprised with a toy at the conclusion of the test as an extra thank-you.

Both the preliminary test and the formal usability tests were influenced by the existing literature on usability tests involving children (Hanna, Ridsen, & Alexander, 1997; Bruckman et al., 2008), the students’ previous experiences with children, and basic tenets of usability testing. The small number of participants was based on the idea that “four to five participants will expose 80 percent of the usability deficiencies of a project” (Rubin & Chisnell, 2008, p. 93), and it also adhered to accepted protocols for usability testing with adults (Rubin & Chisnell, 2008; Nielsen, 2000). The experience confirmed other findings that children are good subjects for usability tests, especially when the product being tested is targeted to them (Van Kesteren et al., 2003; Gibson, Sloan, & Gregor, 2001). The children participating were interested, focused on the task, and honest in their assessments. The results and discussion that follow are based on the two formal usability-testing sessions.

Guidelines for Creating Educational Web Sites for Children

By comparing the consistent themes from the literature review with the findings from our own usability test, we developed the following guidelines for designing educational Web sites for children. The guidelines are divided into three primary categories: appearance, content, and navigation. Each primary category also includes several subcategories that focus on more specific design features. (See the appendix for a quick reference of these guidelines.)

Before taking the following guidelines into consideration, one must remember that our research has many limitations. Usability testing involving children, particularly in this age group and particularly for educational supplements, is a relatively unexplored

area. Furthermore, our usability test only reinforced the use of these principles in a single Web site (the CARES Playground) designed for children ages 7 to 9. However, we hope that these guidelines will provide a better starting point for designing Web sites for children than traditional guidelines involving adults’ Web preferences. Since all the information on designing Web sites for children emerged from the literature of designing Web sites for adults, the themes are not unfamiliar. However, the best interpretation of those common issues for children—as well as the children’s reactions to them—may be surprising. Further research is needed to confirm and expand upon these principles.

Navigation: Hierarchical, Exploratory, Multiple Cues

Most guidelines for adult sites focus on helping the user find a specific piece of information (Krug, 2006, p. 54) or “on helping the user choose his/her next destination” (Farkas & Farkas, 2000, p. 342), but children’s educational Web sites are more concerned with creating navigation that seamlessly guides children through the educational experience. According to e-learning specialists Clark and Mayer (2008), learners should have more control when the primary goal is to provide information (p. 312). Navigation, however, should still provide a predictable pattern of development that enables children to work at their own pace. Harbeck and Sherman’s principles suggest that children’s Web sites should “provide clear, simple navigation” that enables exploration “through multiple branching options (depending on the age of the child)” (1999, p. 42). To achieve this goal, we recommend a navigational structure that is hierarchical and that contains multiple cues. Image maps, to be discussed in more detail later, are particularly effective for achieving a successful interactive navigational experience.

Hierarchical Navigation Navigation is particularly tricky when designing for children, as a child’s spatial cognition is not as fully developed as an adult’s. While studies have shown that adult users can easily get lost in complex navigational patterns, children are even more prone to this “placelessness.” Children easily become lost because they do not have advanced spatial cognition and therefore cannot deduce where to go unless explicit clues are present. In practical terms, this means that prominently placed literal icons and directional images can help children find their way back to the home

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page or to previous screens. We also recommend limiting navigational topics. When children are given too many topics or choices, they are easily distracted and often lose their way when trying to use the “Back” button to return to a familiar place.

Since simple navigation is key to usability in Web site design for children, the CARES Playground employed a hierarchical navigation pattern with limited options. This type of navigation involves minimizing the number of initial choices to prevent children from becoming overwhelmed. In the interest of both usability and harmony of design, the graduate students limited the number of primary navigation categories to four and tied these categories to the four segments of the CARES kite logo. Since children at this age have difficulty processing a large number of choices (Piaget, 1970), we recommend no more than five initial choices for children in this age range. See Figure 1 for the CARES Playground launch page.

Image Maps Children ages 7 to 9 can better navigate a site that uses a visual map for navigation (using images to represent topics) than one that simply lists topics in a traditional navigation style (Harbeck & Sherman, 1999; Rose et al., 2009). On the launch page of the CARES Playground (shown in Figure 1), children have the option to navigate textually on the left, or by icons in the image map (center). (Textual navigation was included to keep this section consistent with the rest of the site, which is targeted toward adults.) None of the children who took part in the usability test attempted to enter the Playground through the textual navigation. Instead, they used the visual image map to begin. See Figure 2 for the rollover effect that appeared when children moved the mouse over the first icon in the image map.

El-Tigi and Branch (1997) believe that image maps “enhance visual display of information” and simultaneously “decrease the sense of disorientation by information overload” (p. 25), two important components of establishing a successful navigation

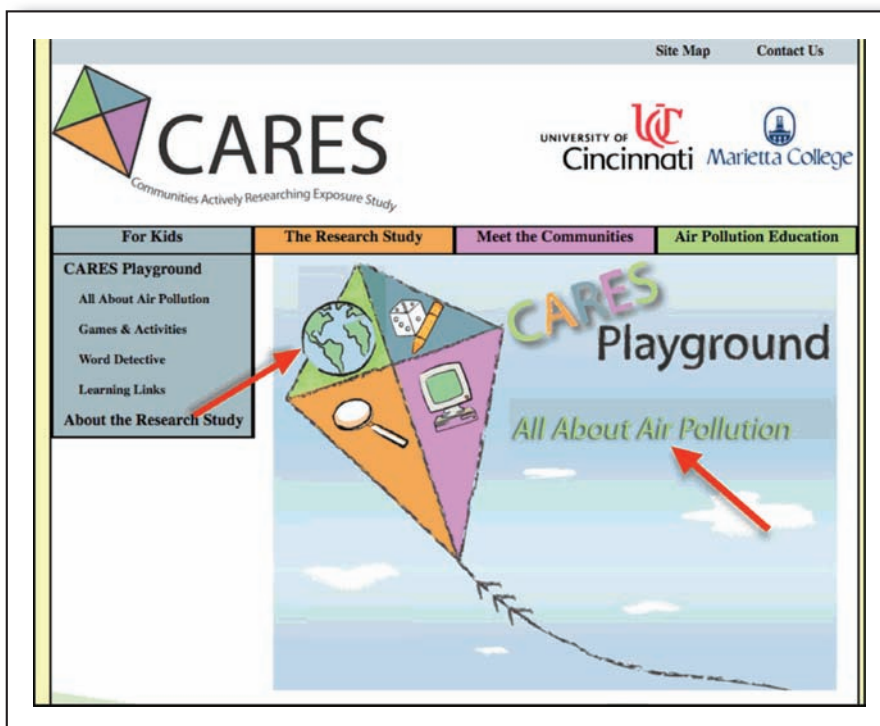


Figure 2. Launch Page with Rollover Activated

scheme for children. Clickable hot spots must be made obvious—for instance, by changing color or blinking upon rollover. Several of the children commented on the rollover feature of the launch page. One child said, “I like how it [the images in the kite] gets bigger.” All of the children were able to successfully and quickly enter the main content areas.

Since children are willing to find clickable areas (Nielsen & Gilutz, 2002), the image map was an ideal solution for the navigation of the content-heavy Air Pollution section. Figure 3 shows an example of one of the image maps. Figure 4 shows the same image map with the rollover effect engaged.

Since children have limited experiences to draw from, their level of familiarity is quite different from that of adults. When dealing with children, one must remember that they are much more attentive to their surroundings than we might assume. Moreover, they are quick to apply what they absorb visually to their daily activities. Thus, the icons need to be realistic and suitable to literal interpretation (Large & Beheshti, 2005). This literal interpretation is driven by what Gelderblom and Kotzé (2009) call familiarity (p. 58) and Williams (2000) refers to as identification (p. 392).

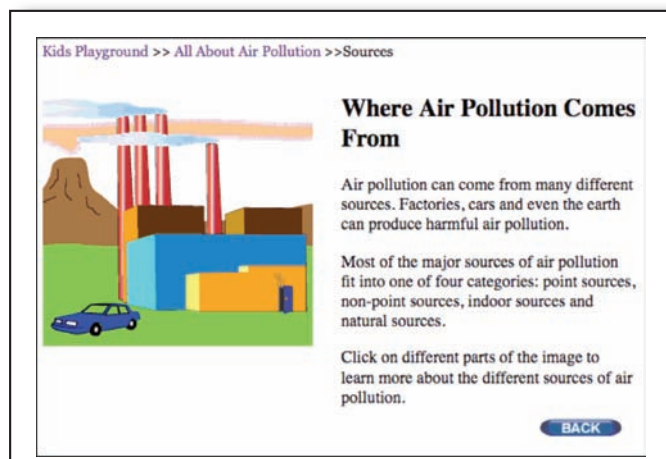


Figure 3. Example of Image Map for Navigation

To maximize the children's ability to relate to the image maps, the images selected were well within the scope of the target audience's everyday recognition. These images also coincide with the children's instinct to interpret concretely and literally. As a primary navigational tool, the image map used in the CARES Playground meets the needs of children because it concretely, vividly, and pictorially helps them understand where they are and how to navigate the educational space. The inclusion of multiple options on each image map follows e-learning principles (Clark & Mayer, 2008, chap. 13) by allowing learners to control parts of the learning experience.

Multiple Cues As Krug (2006) notes (when considering the design of sites geared toward adults),

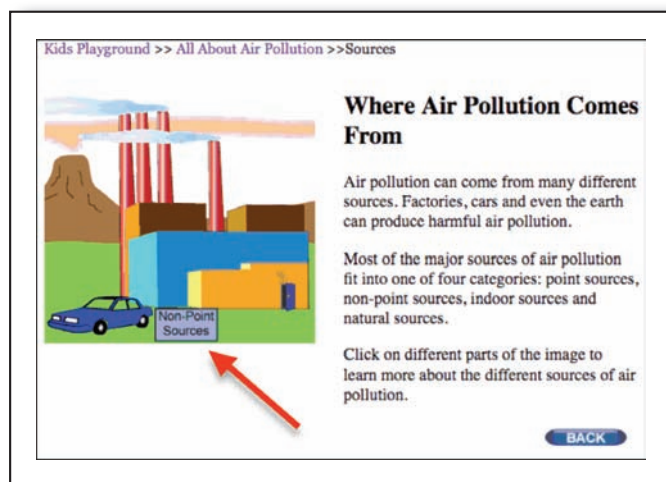


Figure 4. Example of Image Map for Navigation with the Rollover Effect Engaged

the Web does not include the same cues that users rely on in their everyday lives to navigate physical spaces. The Web lacks a sense of scale, location, and direction (p. 57), which is further compounded when designing Web sites for children. Since children do not have a fully developed sense of space and navigation even in physical spaces, their options for moving about online are even more inhibited. Children ages 7 to 9 are able to use a variety of information-processing strategies, but they need prompts or cues to stimulate them (Rose et al., 2009, pp. 6–7). Since children do not have the same temporal recall as adults, multiple navigational cues are necessary. Multiple cues are also commonly used in e-learning to allow learners to control the educational experience (Clark & Mayer, 2008, p. 294). Figures 3 and 4 show three separate ways for children to navigate a single section: breadcrumbs at the top of the page, the image map in the center, and the “Back” button at the bottom right of the page. This particular combination of strategies worked well for the children who participated in the usability test.

While children often do not understand temporal and spatial associations, they do understand the concept of “back.” Like Naidu (2005), we found that children used the browser’s “Back” button repeatedly. When given another “back” choice, such as breadcrumbs (see figures 3 and 4), children used it as well. Thus, we recommend an emphasis on multiple ways to get “back” home. One caution, however, is that children participating in our usability test did not recognize the Web site’s logo as an option for returning to the home page.

Overall, the children graded the site’s navigation as follows: five As, three Bs, and one C. These grades reflect the children’s frustration with pop-up windows (discussed further in the next section) and their suggestions to include more navigational cues in the Word Detective area.

What Not to Do Based on our usability test, we would recommend not including three features commonly found on Web sites designed for adults: search options, in-text links, and pop-up windows. These three features do not increase the usability of educational Web sites for children.

The decision not to include a search function in the CARES Playground was based primarily on the desire to minimize distractions on the site. While many

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adults may use search boxes frequently, children have not yet fully developed the intellectual ability necessary to generate relevant search terms (Druin et. al., 2009). In addition, giving children the option to search would undermine the process of having them read through the information and explore the Web site (Bilal, 2001).

While in-text links are common in sites for adults, e-learning research suggests that links are perceived as supplemental to the main information. Because of this, their use is discouraged, especially with novice audiences (Clark & Mayer, 2008, p. 308). Since children are novice users and their sense of spatial connection is less developed, we recommend not including in-text links. In both the informal and formal usability tests, not one child clicked on any of the multiple in-text links. For children, it seems that in-text links are simply another design feature, i.e., blue text, rather than a way to move around the site. When asked what they thought the in-text links would do, one child commented that they “don’t do anything special,” and another said she did not “care really about it.”

We would also strongly recommend, especially for this age range or younger, the omission of pop-up windows of any kind. E-learning research confirms that “separate windows” should be used sparingly (Horton, 2006, p. 498), but for children, the use of pop-up windows further complicates their spatial recognition. The children participating in the usability test universally panned these windows. They became frustrated when trying to return to the previous page, especially when trying to figure out how to close or “get out” of the pop-up.

Appearance: Simple, Concrete, Active, and Enjoyable

Harbeck and Sherman recommend that children’s Web sites should have an appearance that is simple, clean, and concrete, yet also active and enjoyable (1999, p. 42). What this means for Web designers and technical communicators is that they need to pay more attention to graphics, color, games, and accessibility.

Graphics As Piaget and others have acknowledged, children in the 7-to-9 (or 7-to-11) age group are concrete learners. Being able to apply their existing knowledge to a new environment reinforces their logical operations, and ultimately, increases their learning opportunities. Therefore, “an interface that mimics real life through the use of graphics is supportive of a young

child’s developmental needs” (Cooper, 2005, p. 289). Making a connection to what children already know (i.e., using the interface to mimic real life) guided the design process and was subsequently supported during our usability tests. A “real life” image map was used as one of the main navigational tools (see the Navigation section above for additional information) and included images that directly related to the content (see Figures 1 through 4).

The movement created by the rollover image map was enough to stimulate the children’s interest and keep their attention focused. We were surprised that the children responded so positively to the image map rollovers because the student designers felt that the rollovers were not technologically sophisticated enough to hold the children’s attention. However, “[w]hile they [children] are capable of interacting successfully with much ‘sophisticated’ software, they still enjoy ‘a playful approach’” (Bruckman et al., 2008, p. 795). Therefore, we would remind Web designers that simplicity and “good” design often go hand in hand.

Part of taking a playful approach is creating age-appropriate graphics, or graphics that children can relate to. The children seemed to identify with the kite icon because they felt it was a signal that the site was for them. When asked if they liked the way the site looked, all of the children responded yes. When prompted for additional comments, one child said that he liked the kite and the “colored in crayons” feel of the main page. Several of the children specifically characterized the kite as “fun.”

The graduate students also took a playful approach when creating an icon for the Word Detective area (see Figure 5), which provided information on words specific to the CARES study. This approach also aligned with the finding that “Mascot characters are popular with children as long as they are considered appropriate for their age group and play a role in the interface” (Large & Beheshti, 2005, p. 330). In this case, the Word Detective icon, complete with his Sherlock Holmes-inspired magnifying glass, helped the children understand that they were looking for new words and therefore played a distinct role in the interface and related directly to the content.

As with design for any audience, inclusion of graphical or visual elements needs to be considered in the context of larger goals. Children do not require

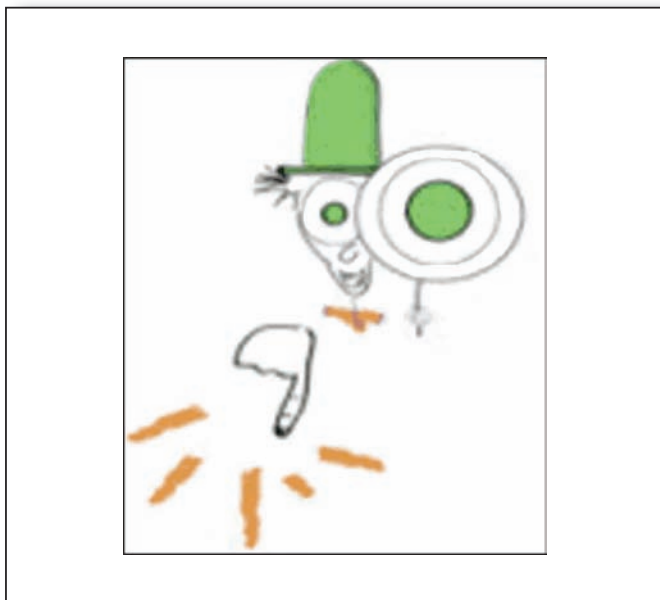


Figure 5. Word Detective Icon

graphical elements for the sake of graphical elements alone—a Web site with a clear navigational pattern, solid content, and a child-friendly appearance will hold a child's attention. Adding animation or graphics that have no defined purpose other than visual interest should be avoided, as extraneous information can actually impede and impair learning (Clark & Mayer, 2008, chap. 7). Extra frames and excessive animated graphics have the potential to confuse Web users of any age. Some graphics may not even load on older computers that lack broadband connections, which could easily frustrate children. Many children use hand-me-down computers at home, and the computers they use at school may not have the capacity to process and display certain visual features.

Color Though Web designers and technical communicators are advised to use color sparingly to draw attention to important elements on sites geared toward adults (Williams, 2000, p. 387), the same does not hold true when designing for children. We found that most of the children participating in the usability tests disliked empty space on the screen and especially disliked a white background, preferring bright colors. Based on these findings, we suggest using vivid colors and vibrant illustrations to attract children's attention. Several of the children mentioned that they liked the “bright colors” used throughout the site.

One example of how Web designers and technical communicators might employ color differently in designs for children than for adults is found in the Word Detective area, which includes the color combination of red and green. During development, an adult who viewed the site called the colors “garish.” However, none of the children made negative comments about the color combinations. As Nielsen (2000) has noted, there is a fine line between what adult designers may think is creative and cute for kids and what the children themselves may call “babyish.” For most of the CARES Playground, we took a cautious approach to color choice, using common color combinations. When the children were asked at the end of the usability test how they would rate the color choices of the site, seven children gave the colors a grade of A, one child gave the colors a B, and one child gave the colors a C. Girls awarded the B and C grades. One of the boys proclaimed that he “loved them.”

Games Play is an integral part of a child's development. Cooper explains that “play is important because it enables children to become familiar with materials and concepts” (2005, p. 290). Really, play is important for anyone at any age. Tinkering becomes practice and eventually culminates in the desired performance. In the case of the CARES Playground, the inclusion of games helped reinforce the educational material and kept the children engaged because they knew they would be rewarded with the opportunity to play a game. One takeaway is not to underestimate the power of simple games. While Harrison et al. (2009) concluded that since they had no budget, they would not include games, the graduate students chose a different approach. For next to nothing, except the time spent researching options, they were able to include (admittedly low-tech) games that the children thoroughly enjoyed, including an open-source, freeware jigsaw puzzle generator and word search puzzles generated from the Word Detective words by a multimedia plug-in (purchased for less than \$10).

In addition to providing children with an enjoyable experience, games and other interactive features need to support the overall objectives of the site. Although research into the effectiveness of games in e-learning environments is still being developed (Clark & Mayer,

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2008, p. 354), however, children in our usability test were willing to read instructions (cf., Nielsen & Giltz, 2002); thus, including games opens up possibilities for integrated activities. Harbeck and Sherman define integrated activities as those that involve and relate to content areas (1999, p. 43). In the case of educational supplements, this means that Web designers and technical communicators must consider how activities on the site can support the overall learning objective. One way to do this is to “not separate the instructional part from the fun part of the product” (Gelderblom & Kotzé, 2009, p. 55). For example, the objective of the CARES Playground was to provide basic information about air pollution and its health effects. The Games and Activities area, as well as additional games in the Word Detective area, both support this objective technologically while also providing an entertaining experience for the children.

Diligent planning is needed to ensure that games and other activities support a site’s learning goals either directly or indirectly. An example of a direct connection is the word search generated using the terms defined in the Word Detective area. The puzzle illustrating a polluted area versus a non-polluted area represents an indirect connection.

Accessibility An important issue in all Web site design is accessibility. The CARES Playground meets the minimum accessibility requirements set by section 508 of the Americans with Disabilities Act and the World Wide Web Consortium Web Accessibility Guidelines, 2.0, so that all children can participate. Keeping Web sites simple or providing alternatives to complex features helps to ensure that all children will have access to the online educational material. Many sites do not meet accessibility standards due to failure to properly code or tag appearance features (i.e., failing to provide an alternate tag for an image so that it can be read by a screen reader). We feel strongly that any Web site created for children, especially an educational site, should surpass the minimum guidelines.

Content: Relevant and Individualized

When it comes to achieving a site’s ultimate learning goals, the most vital aspect is the content. Regardless of how well the CARES Playground connected with children, it needed to increase their knowledge about air pollution. Harbeck and Sherman (1999)

recommend that content should be individualized and relevant to children, which can be achieved by attention to age appropriateness, readability, and page length. This approach was effective for the CARES Playground.

Age Appropriate The needs of children vary widely because their individual abilities span a broad spectrum. Even within a consistent age range of 7 to 9 years old, we saw a diverse array of reading abilities. Our usability tests exposed the broad range of reading abilities in this age group, complicating the already difficult task of writing complex information in an age-appropriate manner. For example, one child asked for the word “vary” to be defined. She knew the word “very,” but the sentence did not make sense when she tried to substitute what she knew. While the word in question was neither large nor complicated, this example illustrates the importance of age-appropriate word choice (European Telecommunications Standards Institute, 2005, p. 21).

When asked what content they found difficult to understand, many of the children replied, “the big words.” “Big words” can be understood to mean words of three or more syllables that were difficult for the children to sound out, such as “assessment,” “dioxide,” and “respiratory.” As we revised the site following the formal usability test, we explained these words in more detail, omitted, or replaced them. However, even these words prompted divergent responses from the children. The children who were better readers had fewer problems, which led us to conclude that when writing content for children, one needs to use vocabulary appropriate for the average reader.

To make the content age appropriate, the graduate students used the familiar to unfamiliar trope. By situating new, complex information in the children’s existing lexicon, the content became more age appropriate and easier for the children to read. For example, in the definitions area, questions were used to situate children in their everyday environment, such as, “You know how each year you learn more so you can go to a higher grade in school?” This familiar experience then leads into defining the term “neurodevelopment”: “So does your nervous system. As you grow, your nervous system becomes stronger and allows your brain to understand stuff so you can do different things like walk or talk.” We recommend this strategy for

developing educational content, as do e-learning experts (Clark & Mayer, 2008, chap. 10). During the usability test, all of the children were able to re-state what they were learning about or identify the topic of each page as they read the content.

Readability The children participating in the usability test were able to read through the content with a high level of attention and interaction. Children may be easily distracted, but they have been conditioned to concentrate when placed in an educational environment. Since our test was conducted at a school in a standard computer lab, the children may have been more inclined to focus on the information and the tasks they were asked to do, which seems to suggest that educational sites can still be successful even when delivering large amounts of information—if they have paid close attention to readability issues.

Unlike Spyridakis' (2000) finding that organizational cues increase comprehension, children do not need the incorporation of multiple heading levels or other cues. Since children recall much less than adults, cues about how information is structured do not

add much value or increase usability of the site. The most important style considerations are concrete words, active verbs, and concise sentence structure, which help children move smoothly through the content.

Nielsen and Gilutz (2002) found that unlike adults, children are actually willing to read instructions. We found this to be true as well and particularly helpful in the context of an educational site. See Figure 5 for an example of directions found on the site.

Educational Web sites can include a large amount of content, as long as that content is organized efficiently and effectively and as long as children have been given clear goals for the session. Like most good teaching practices, the incorporation of Web sites as educational material needs to be clearly laid out and explained in terms of the learning objectives.

Page Length Both Nielsen and Gilutz (2002) and Naidu (2005) concluded that children do not scroll down the page. However, we did not find this to be true. We found that children were willing to stay focused on the content because the site was characterized as educational and the test was held in a school computer lab. In the content-rich areas of the Web site, the children were asked if they thought the amount of information on the page was too much, too little, or just right. Eight of the children said the amount was just right, while one said it was too much. However, two of the children qualified their "just right" answers by reinforcing the fact they did not like nor understand "big words."

While adults prefer short, scannable "chunks" of texts, their quantitative approach to evaluating page length does not hold in the context of a children's site. Instead, considerations for children's content include how easy it is to understand and how well the page flows. Limiting the length of sentences and paragraphs improves readability for children. We suggest, then, that page length be segmented based on the idea or concept that the lesson needs to convey. For example, in the air pollution section, the graduate students broke large volumes of content into segments based on one specific idea (Clark & Mayer, 2008, pp. 180–190). By breaking information into logical segments based on the content and keeping a close eye on the readability of sentences and paragraphs, Web designers and technical communicators can increase the chances that children will actually learn the information presented on an educational site.

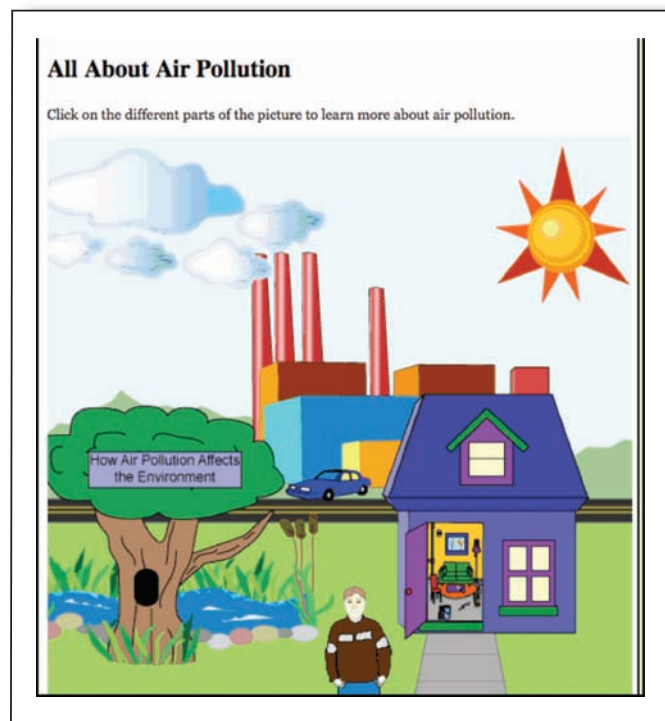


Figure 6. Partial Page Example Showing Instructions to the Children

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Calls for Additional Research

Too often as technical communicators, we rely on our own intuition or formulate a “best guess” from related guidelines rather than working from empirical evidence. Usability testing with and for children is a virtually untapped research area. Other than the rich set of studies on children’s use of Web portals and mitigating online risks to children, much more research is needed in almost every other aspect of Web design and usability across most age groups.

Unfortunately, children’s differences from adults place unique limitations on virtually any study involving their Web preferences. For example, children’s developmental patterns are so diverse that, despite usability test best practices stating that five users can find most issues (see Rubin & Chisnell, 2008; Nielsen, 2000), we feel that an even larger number of users need to be tested when working with children to control for a wider range of individual abilities. We recruited 10 instead of five children, and feel that including even more children—about 15—would provide more definitive results.

There are also some limitations specific to this particular study. Because the CARES project has a very specific geographic focus, the resulting demographics of the children who participated in the formal usability test (rural and a lower socioeconomic class) may have impacted the results. Moreover, their less-than-daily computer usage both at home and in school seems limited, and could certainly have affected their Web preferences. However, when results from the formal usability test were compared to the results of the preliminary usability test, which included three children from a very different demographic (urban, higher socioeconomic class, greater at home computer use), no major differences were exposed.

Despite these limitations, the preliminary and formal usability tests were fairly conclusive about children’s preferences in the areas covered above. Other specific anomalies within our project lead us to suggest six areas for additional research: four areas specific to Web site characteristics and two specific to audience segments.

Website Characteristics

Scrolling and/or Page Length The results of our usability test seem to partially contradict previous

findings (Nielsen & Gilutz, 2002; Naidu, 2005) regarding children’s preferences when it comes to page length. The children participating in our formal usability test (and even in the graduate students’ informal test) were not averse to scrolling. When asked directly whether a long page should be divided into separate pages, the children were split: five said yes and four said no. Further complicating the issue, one of the children who said that the page should be divided also remarked that he enjoyed scrolling up and down the page. We would initially hypothesize that the children’s willingness to scroll may be because they interpreted the usability test as a school exercise (since it was located in a classroom setting). More research is needed on children’s use of the Internet for educational activities—both inside and outside of the classroom—as opposed to entertainment activities to shed further light on children’s preferences regarding page length and their willingness to scroll.

Font Size and Font Type The questions on the usability test that related to content also attempted to address issues of font size and typeface. However, since we did not test the site using different font sizes, we cannot state conclusive results on this subject. One area where the children commented directly on font size was the word search puzzle. A majority of the children wanted a larger font size, and two children specifically mentioned that the “letters should be bigger.” The point size of the letters in the word search puzzle was 10, while the font on the rest of the site was size 12. Other than two small studies (Bernard, Mills, Frank, & McKown, 2001; Naidu, 2005) which found that children preferred 12- or 14-point type, no other empirical evidence exists regarding children’s font preferences. Technical communicators need studies on children’s preferences about font size and font type to complement existing adult-centered work (Brumberger, 2003, 2004; Mackiewicz, 2005; Mackiewicz & Moeller, 2004).

Color Our work confirms previous research (Large & Beheshti, 2005) that children do not like white, empty space and that they prefer bold, vivid, and vibrant colors. However, even though we know children prefer bold and vibrant colors, we have little understanding of what that really means and what the limits of vibrancy are. We still do not understand the nuances of color and color combination preferences. The fact that one of the parents commented on the “garish” colors while

not one child made any negative comments about them only illustrates how little we really know about children's specific color combination preferences.

Sound Unlike adults, who have overwhelmingly disapproved of automatic sound on Web pages (Nielsen, 2004), the children participating in our usability test unanimously approved of having automatic sound, or sound that begins to play when they enter a new page or start a new activity. Children also did not mind hearing sound from another child's computer while they themselves were moving through parts of the test without audio features. Additional research is needed to determine if there are any changes in learning outcomes when sound is incorporated, as well as at what age a child's preferences change.

Audience Segments

Gender Differences More research is needed to determine the impact of a child's gender on his or her stated design preferences. We observed a marked gender difference in response to the Word Detective icon (see Figure 5). Even though all of the children understood the icon, the boys liked the icon, while the girls did not. One of the girls mentioned that she thought the icon was "weird looking" because it had a "little green eye." None of the boys had anything but positive comments about the icon, with one boy even saying that he liked "the big green eye." The reactions to this one visual element cannot be discounted and could potentially have major impacts on design guidelines if future research reveals that boys and girls consistently react differently to icons.

We also noticed minor differences in how the girls and boys read the content. After additional analysis, we realized that these differences were related more to inconsistent reading skills among users than to the content itself. However, other researchers (e.g., Taslim, Adnan, & Bakar, 2009) have found a difference in how boys and girls read content on the Internet, which means additional research is needed to provide more definitive answers.

Younger Children One of the problems encountered during this project was the lack of research on design for children in general and for younger children in particular. Staksrud, Livingstone, Haddon, & Olafsson (2009) report that for every study they found on 5-year-old children, they found 10 studies on 14-year-olds, and

they go to great lengths to highlight the limited amount of research on children ages 9 and younger (p. 11). Although we have not conducted a meta-analysis similar to Staksrud et al.'s U.K. study, we feel a U.S.-centered meta-analysis would produce similar results. The lack of research in this area is a cause for concern, especially considering the large—and growing—numbers of children ages 9 and younger using the Internet.

Conclusion

Usability testing becomes even more important when designing Web sites for children because of developmental differences and the diversity of learning goals for children's educational Web sites. Because of the lack of empirical research and the lack of children-centric design guidelines, many existing educational Web sites are geared toward a broad range of users, such as K–12, K–8, or 9–12, nearly guaranteeing that the site will not meet the needs of a large segment of users. When our usability test was concluded, we asked the children if they thought they would like to use a resource like the CARES Playground in school. All of the children said yes. The influence and impact of the Internet on children's education will only continue to increase, and as this research project shows, there is great potential for technical communicators to not only work in this new and vibrant research area, but to lead the effort. Therefore, technical communicators, many of whom participate in the development of Web sites and/or educational supplements for children, need to have basic guidelines to help direct their work.

The overarching implication for Web designers and technical communicators is to remember that creating educational Web sites for children is not the same as creating Web sites for adults. While an obvious statement, it cannot be stressed enough that children and adults approach Web sites differently and that children in different age ranges also approach Web sites differently. With children making up such a large segment of Internet users, technical communicators should lead the way in creating effective educational Web sites for children, simply by understanding their unique needs and preferences.

Although our research—which, admittedly, has its limitations—is a first attempt to create children-centric Web design guidelines, we believe that by using the

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guidelines suggested, technical communicators are better positioned to create educational Web sites to meet the needs of children ages 7 to 9 and even to design more effective sites for children in other age groups. Moreover, educational sites that have been created using proven guidelines have greater potential to increase student engagement and student learning. Thus, it is in the best interest of technical communicators to have a set of guidelines based on empirical evidence that speak to how they can best create those learning environments.

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Appendix

Element	Considerations for Children	Recommendations
Navigation		
Hierarchical Navigation	Children do not have a fully developed sense of space or temporal recall, and can easily become lost in complex navigation.	<ul style="list-style-type: none"> • Limit navigational topics. • Use literal icons and directional images to point the way through the navigation. • Do not include search options, in-text links, or pop-ups—all add an unnecessary layer of complexity.
Image Maps	Seven- to nine-year-olds find it easier to navigate visually. They also interpret icons literally.	<ul style="list-style-type: none"> • Take care to make clickable hotspots obvious through rollover effects (e.g., blinking, changing color). • Use representational images that children can recognize from their everyday lives.
Multiple Cues	Children need specific prompts to stimulate their understanding of navigation.	<ul style="list-style-type: none"> • Provide multiple options for navigation (e.g., breadcrumbs, prominently-displayed “back” button, browser’s “back” button).
Appearance		
Graphics	Children appreciate simple, playful graphics. They interpret icons literally.	<ul style="list-style-type: none"> • Use images from children’s everyday lives. • Age-appropriate mascots can be helpful, but they should play a role in the interface. • Avoid graphics for visual interest alone.
Color	Children don’t like white backgrounds or empty space. They enjoy a variety of color combinations that adults would find “garish.”	<ul style="list-style-type: none"> • Use vivid colors. • Avoid excessive use of white.
Games	Children enjoy games even if they are cheaply created.	<ul style="list-style-type: none"> • Incorporate games that play a role in the site’s learning objectives.
Accessibility	Content that would be confusing to an adult would be even more so to a child.	<ul style="list-style-type: none"> • Surpass minimum WCAG 2.0 guidelines so that all children can participate. • Keep sites simple or provide alternatives to complex content.
Content		
Age-Appropriate	Children vary widely in reading ability.	<ul style="list-style-type: none"> • Use content appropriate for the average reader in the site’s target age group.
Readability	Children’s recall is less than that of adults. Organizational cues (subheadings, etc.) don’t help them. They are willing to read instructions.	<ul style="list-style-type: none"> • Use concrete words, active verbs, and concise sentence structure. • Organize content efficiently and effectively. • Provide clear directions and goals.
Page Length	Contrary to previous findings, the children in our usability test were willing to scroll down the page.	<ul style="list-style-type: none"> • Limit the length of sentences and paragraphs to increase readability. • Segment page length based on concepts.

Avon J. Murphy, Editor

Books Reviewed in This Issue

Graphic Design Theory: Readings from the Field
Helen Armstrong, ed.

The Presentation Secrets of Steve Jobs: How to Be Insanely Great in Front of Any Audience
Carmine Gallo

Field Guide: How to Be a Graphic Designer
Ana Labudović and Nenad Vukušić

Thanks, but This Isn't for Us: A (Sort of) Compassionate Guide to Why Your Writing Is Being Rejected
Jessica Page Morrell

Voice & Vision: A Guide to Writing History and Other Serious Nonfiction
Stephen J. Pyne

Designing the User Interface: Strategies for Effective Human-Computer Interaction
Ben Shneiderman and Catherine Plaisant

Beautiful Teams
Andrew Stellman and Jennifer Greene, eds.

Knowledge Management Primer
Rajeev K. Bali, Nilmini Wickramasinghe, and Brian Lehaney

Online Communities Handbook: Building Your Business and Brand on the Web
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419 97 Things Every Project Manager Should Know: Collective Wisdom from the Experts 427

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420 Speaking in Styles: Fundamentals of CSS for Web Designers 429

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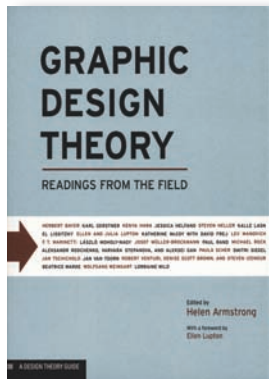
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Graphic Design Theory: Readings from the Field

Helen Armstrong, ed. 2009. New York, NY: Princeton Architectural Press. [ISBN 978-1-56898-772-9. 152 pages, including index. US\$24.95 (softcover).]



In introducing her slim volume, Helen Armstrong describes conflicts between the graphic designer's desire to be acknowledged and the anonymity enforced by the profession (speaking in the client's voice), and between the hope that our software tools liberate our creativity and the fear that they constrain our ability

to communicate, as Edward Tufte famously claimed about PowerPoint. That sounds awfully similar to the concerns of technical communicators. In her foreword, Ellen Lupton notes, "Theory is all about the question 'why?' The process of becoming a designer is focused largely on 'how': how to use software, how to solve problems, how to organize information" (p. 6). This reminds us of the admonition to give the *why* at least as much weight as the *how*. If these points resonate with you, you should read this book: We can learn much about our own profession by observing how others embrace and struggle with their challenges.

The selected texts by key figures cover the history of modern design, showing where the field came from, the challenges and setbacks it encountered along the way, and where it may be heading. For example, authors chronicle the century-long dialogue between modernism's quest for a pure and objective visual language (as embodied by the Bauhaus school), and postmodernism's emphasis on vision's irreducible subjectivity and the audience's primacy. Sadly, rather than using this tension to strengthen both schools, many graphic designers have retreated into absolutist politics.

Selections contrast extremes of opinion, such as Marinetti's radical (indeed, offensive) futurist manifesto, with its almost pornographic love of technology, and Rodchenko's humanism ("technology is—the mortal enemy of art" [p. 23]), and compare less extreme viewpoints on design's social implications and the designer's responsibility. Some even attempt

to synthesize the more extreme viewpoints from the endless debate between aesthetic and pragmatic design (form vs. function). Beatrice Ward, for one, emphasizes how beauty can be reconciled with practical, utilitarian concerns. Through these contrasts, Armstrong provides a fascinating portrait of social and technological change, and of a profession's roles in this change. She reveals new ways to see and reminds us just how differently others may see.

One trend has been the evolution from designer as producer (conduit for information) to author (creator or originator) or even "mediator" between client and audience, providing more opportunities for agency and power. Technical communicators struggle with the same problems of self-definition and power, and learning how graphic artists have attempted to reinvent themselves and their work may help us change the perception of our own profession as "glorified typists."

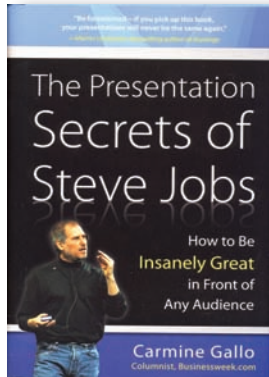
The writing, by those who participated most loudly in the debate, ranges from incoherent and melodramatic to simple and eloquent, but it always reveals a passion that technical communicators have seemingly forgotten. *Graphic Design Theory* provides snapshots of a century of rapid change, not the editor's synthesis—thereby producing an almost "expressionist" work in which we are told not *what* to think and feel but rather *that we should* think and feel. Such passion remains important in our work, and that message alone makes the book a worthy read.

Geoff Hart

Geoff Hart is an STC fellow and information designer who can draw a straight line with a ruler on a good day, but who nonetheless has an avid interest in graphic design theory.

The Presentation Secrets of Steve Jobs: How to Be Insanely Great in Front of Any Audience

Carmine Gallo. 2010. New York: McGraw Hill. [ISBN 978-0-07-163608-7. 238 pages, including index. US\$21.95 (hardcover).]



At first, I thought Carmine Gallo was going to deliver only an enthymeme: *Steve Jobs gives (insanely!) great presentations; therefore, those who mimic Steve Jobs will be great presenters.* The missing premise showing *how to mimic Steve Jobs' presentation style* is the book's underlying intent, but even Gallo admits that we cannot copy

Jobs's every move. More than once, he remarks on Jobs's overly casual style of presentation dress (sneakers, jeans, turtleneck) and then admonishes us: "you're not going to dress like him. He can get away with it because he's Steve Jobs and you're not. Seriously" (p. 195).

Gallo delivers presentation tips through induction, gleaning details from Jobs's talks and then establishing general principles on how we can wow audiences. Some of the advice is not new, although Gallo does offer a creative spin: give a strong opening and set the theme early ("Answer the One Question That Matters Most" [p. 15]), open and close each section with a transition ("Create Twitter-Like Headlines" and "Draw a Road Map" [pp. 39, 49]), sell an experience, not a widget ("Channel Their Inner Zen" [p. 87]), and rehearse like crazy ("Master Stage Presence" and "Make It Look Effortless" [pp. 167, 179]).

So what makes Gallo's book different from other how-to presentation books? Because of Gallo's extensive experience as a speaker himself and as a communication-skills consultant to many famous presenters, he has countless stories of presentations gone awry as well as success stories. His narratives captivate, making us feel as if we are living the memory of these presentation gaffes and triumphs. For example, during a keynote Jobs made a prank call to Starbucks from his new iPhone and ordered 4,000 lattes to go. Gallo can explain that even

pranks like these are scripted, for he has witnessed the slide notes firsthand.

Gallo has viewed, either in person or by analyzing YouTube videos, probably every Jobs presentation ever given. At times, the book does teeter toward hero-worship, yet when we consider Jobs's cult-like following, Gallo's language is not surprising. He refers to "The Apple Religion" to describe Apple users and writes, "True evangelists are driven by a messianic zeal to create new experiences" (p. 33). Offsetting this religious rhetoric is the use of several cuss words, including a chapter teaching presenters how to "Reveal a 'Holy Shit' Moment." Ironically, Jobs himself is allegedly a Zen Buddhist.

Set up like a three-act play, the book contains 18 chapters ("scenes"), brief asides ("intermissions" and "director's cuts"), and a compelling afterword ("encore"). We may find Gallo's organizational approach gimmicky after a while, but its setup does mean that in using narratives instead of bullets, Gallo practices what he preaches about promoting more visuals as opposed to slides with copious bullets. My favorite line, after noting that Jobs has never used a single bullet point in any of his presentations: "By now I hope you have decided to gather up your current slides, especially those with bullet points, and burn them" (p. 97).

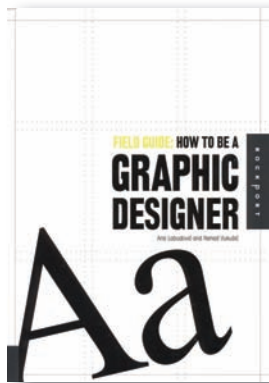
Gallo's book is an homage to Jobs, who, above all, has an unquenchable love of drama. I find helpful both the abundant stories and the tips on how to improve my own presentation persona. I especially enjoy Gallo's slide analyses, side-by-side tables of what is on Jobs's slides (usually one word or visual) compared with what Jobs says to the audience (quite a lot). Although I had never witnessed a Steve Jobs talk, I now have watched several of his presentations on YouTube, and I plan to show my own students some clips. Despite any stylistic drawbacks, Gallo writes to move his audience—even us skeptical readers—to action, and that is exactly what *The Presentation Secrets of Steve Jobs* delivers.

Nicole Amare

Nicole Amare is a senior member of STC and an associate professor of technical communication at the University of South Alabama. Her research interests include ethics, editing, and visual rhetoric. She is associate editor of *Industry Practices for IEEE Transactions on Professional Communication*.

Field Guide: How to Be a Graphic Designer

Ana Labudović and Nenad Vukušić. 2009. Beverly, MA: Rockport Publishers. [ISBN 978-1-59253-490-6. 191 pages, including appendix and bibliography. US\$30.00 (softcover).]



Field Guide: How to Be a Graphic Designer provides a postmodern view of what it takes to enter the graphic design profession. The book is not the manual that one might expect from its title; the authors plainly state that their book “has no definitive answers and offers no linear path to success” (p. 8). Instead, Labudović and Vukušić

describe several aspects of the graphic design profession and provide short profiles of about 30 designers, each of whom became a designer following his or her own path.

The authors gathered information through interviews of designers and studio directors and through online surveys of designers. Although the authors do not describe their survey techniques in detail, they report receiving 2,096 survey responses. If we can assume that the survey participants comprise a representative sample, that number is large enough to support effective generalizations about the design community.

Labudović and Vukušić cover six main topics: defining graphic design and identifying disciplines within it, choosing among education options, getting a job, sustaining self-employment as a designer, creativity, and managing projects. Each chapter features interviews with practicing designers. Color photographs and examples of those designers’ works abound, making this book interesting and appealing while also establishing each designer’s ethos for the reader.

The authors identify important principles for each of their main topics but usually stop short of making broad pronouncements. The chapter on education, for example, includes quotes from art school graduates as well as those who learned on their own and on the job. Learning through school and learning independently are presented as equally valid choices. Labudović and Vukušić do provide more specific guidance in the chapter about establishing one’s own design firm: write a business plan, hire an accountant, hire a financial manager, sign contracts with all clients,

don’t undercharge for your services, and keep a certain percentage of money on hand.

The project management chapter includes a picture of Stoll’s triangle, which was unfamiliar to me. It is a simple but memorable tool for estimating and conceptualizing projects. An isosceles triangle has one word at each corner: “good,” “fast,” or “cheap.” According to Stoll, a project can embody any two of those traits, but not all three.

Selections from the survey data complement the discussions in each chapter. Chapters are preceded by hand-drawn illustrative information graphics; for example, responses to a question about the number of hours worked in a week are shown by a series of eyes with increasing numbers of “bags” beneath them. Qualitative responses to open-ended questions show a wide range of points of view.

Although it is not a handbook on what to do and how to do it, this book discusses a range of the challenges designers face as students, as coworkers, as vendors working with clients, and as creative individuals. My own title for this book would be *So You Think You Want to Be a Graphic Designer?* It boils down the experiences of many designers and gives readers a lot to think about.

Russell Willerton

Russell Willerton is a tenured member of the English faculty at Boise State University.

Thanks, but This Isn’t for Us: A (Sort of) Compassionate Guide to Why Your Writing Is Being Rejected

Jessica Page Morrell. 2009. New York, NY: Jeremy P. Tarcher/Penguin. [ISBN 978-1-58542-721-5. 358 pages, including index. US\$16.95 (softcover).]



If you have written and submitted fiction, you have probably seen your share of stock rejection letters, most of them polite but not very helpful. In *Thanks, but This Isn’t for Us*, veteran writing coach, developmental editor, and writing instructor Jessica Page Morrell explains what rejection letters usually leave

out: why your manuscript failed to be a marketable product and what you can do about it. While targeted at would-be writers of novels and memoirs, many of the ideas in *Thanks* could be applied by anyone interested in crafting effective narratives, including instructional designers, technical and marketing writers, and even those needing to tell their own story as part of a career strategy.

In addition to *Thanks*, Morrell is the author of *Bullies, Bastards & Bitches: How to Write the Bad Guys in Fiction* (Writer's Digest Books, 2008) and *Between the Lines: Master the Subtle Elements of Fiction* (Writer's Digest Books, 2006). Morrell says that less than 1 percent of submitted fiction manuscripts get published. This is partly due to the economic realities of modern publishing, but also due to the prevalence of common blunders that appear again and again to doom submitted manuscripts. Lacking a sufficient mastery of their craft and the fiction editor's experienced eye for both good and poor writing, many aspiring writers fail to recognize fatal flaws in their own work.

In *Thanks*, Morrell isolates and discusses the most common mistakes and tells how you can avoid them. In fifteen lively chapters, she addresses the major areas of the fiction writer's craft. She covers such things as the need for a strong opening that hooks the reader; using change, adversity, and action to shape a story; creating suspense; the importance of conflict; creating potent and memorable characters; and using scenes as building blocks for your story. She also covers handling dialogue, using physical details to make the writing come alive, and things to check on during the final edit.

What sets *Thanks* apart from many other books of advice on fiction writing is its practical, down-to-earth coverage of what actually goes wrong in rejected manuscripts. With wit, wisdom, and compassion, Morrell names, describes, and gives examples of the most common deal breakers that lead to rejection. For example, the chapter on writing openings discusses such unsuccessful openings as "Country Roads" (opening with a long, leisurely scenic tour that lacks "intrigue, tension, or conflict"), Crash Course (opening that dumps too much information on the reader too soon), Not Much Going On (protagonist just thinking and killing time), Paint-by-Number (clichéd opening that has been done to death), and others. To help you see with an editor's eyes, Morrell illustrates many potential deal breakers with mock passages written in

the offending style. The book also suggests potentially more successful writing strategies, and includes practice exercises, checklists, lists of recommended resources, and glossaries of basic fiction and publishing terms.

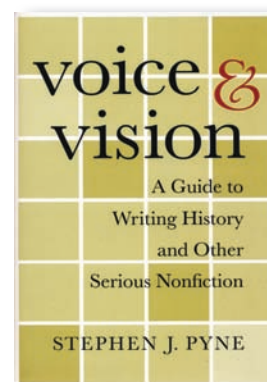
If you are getting rejections, or just want to improve your chances of success, *Thanks* would be a good place to turn for help. Even if you are a writer who does not expect to produce commercial fiction, you may find *Thanks* useful. At its core, it is about the art and craft of narrative and meeting audience expectations, and as such, it has much to say not just to entertainers but to anyone—technical communicators included—who uses stories to reach, teach, and persuade.

Patrick Lufkin

Patrick Lufkin is an STC Associate Fellow and is currently chair of the Northern California STC Kenneth M. Gordon Memorial Scholarship and Membership Manager of the STC Management SIG.

Voice & Vision: A Guide to Writing History and Other Serious Nonfiction

Stephen J. Pyne. 2009. Cambridge, MA: Harvard University Press. [ISBN 978-0-674-03330-6. 314 pages, including index. US\$25.95.]



The best way to describe the purpose of *Voice & Vision* is to borrow a phrase from adman David Ogilvy: "It is a sin to bore your fellow man." The idea, of course, is nothing new. Rudolph Flesch did a great job knocking down the walls of the up-with-which-I-will-not-put school of writing. But important ideas—and this is important for technical writers and for everyone interested in understandings—often need to be constantly refreshed, refashioned, augmented for the times. Pyne's book makes its contribution to the rebuilding process.

The author's purpose is to show how literary considerations can enhance the writing of serious nonfiction. Craft, he urges, is "what makes narrative out

of facts, drama out of data, and history out of dates and artifacts" (p. 11). Many in business and technical writing feel that "literary considerations" tend to bend the facts. But there are always better ways to express what you want without falsifying the information. The trick, he suggests, is "knowing how elements of style can advance your purpose as a writer" (p. 17).

Pyne shows how some elements of literary writing—including journalism and popular nonfiction—can be adapted to technical writing. For instance, he provides a wonderful term, *plot surrogates*. "The progression of sources may be logical or chronological." The document "might develop from one datum point to the next"; one might "organize the text by space rather than time . . . contrast periphery with its core . . . arrange it by orders of magnitude." Such arrangements, suggests Pyne, convey "an ordered progression that does for your text what traditional plotting does for traditional narrating" (pp. 84–85). He again offers the term *surrogates* in place of the traditional concept of character associated with fiction. Even if the primary purpose of a document is a place, a social institution, or a scientific concept, the document that fits in human characters will be a lot more interesting.

The author cites Orwell's strictures against clichés, overused metaphors, and pretentious diction, to which we might add overused jargon. He adds, "If you have something truly new to say, you may need to devise a new way to say it" (p. 70). He tackles simplicity: "If the point of writing is to convey meaning, we would do well to remember that the mind often works figuratively and delights in occasional alliteration and rhyme, and tends to recall wordplay and striking phrases; and that what appears to the prose puritan as decoration may in fact assist understanding" (p. 131).

Dramatic principles apply to technical communication, for we must keep the reader interested and turning the page. Even an informational document "tells readers something they didn't know, or describes some practice or procedure or skill. We read on because we want to know how things turned out—what the laboratory results add up to" (p. 105). Interest can never be taken for granted.

Pyne offers worthwhile points on graphics. He freshly compares visuals to pilings beneath a bridge, bearing enormous weight and allowing prose to flow freely. In other words, often keeping the text from getting bogged down in endless description

or presentation of data. Graphics can unburden the text and allow "access to quantitative data that might otherwise be dismissed because it cannot be reconciled with words."

All in all, Pyne has some very useful suggestions for delivering more compelling technical documents.

Steven Darian

Steven Darian retired from a career at Rutgers University, where he taught business communication, technical writing, and other language-related courses. His work in several countries includes managing a training school for Raytheon Corporation in Saudi Arabia and teaching in China. His most recent book is *The China Business Reader* (2006).

Designing the User Interface: Strategies for Effective Human-Computer Interaction

Ben Shneiderman and Catherine Plaisant. 2010. 5th ed. Boston, MA: Addison-Wesley. [ISBN 978-0-321-53735-5. 606 pages, including index. US\$101.00.]



As human-computer interaction (HCI) becomes more integrated into the disciplines of computer science, information science, and technical communication, the number of textbooks in the field increases every year. Ben Shneiderman's *Designing the User Interface* is one of the classics of the field, first

released in 1986 and now in its newly released fifth edition. This edition includes contributions from coauthor Catherine Plaisant, who joined Shneiderman for the fourth edition, and collaborators Maxine S. Cohen and Steven M. Jacobs.

By design and intent, the book is a graduate-level survey of most major HCI topics, with detailed reference lists to allow further exploration. It is comparable to other graduate-level textbooks such as Helen Sharp, Yvonne Rogers, and Jenny Preece's *Interaction Design: Beyond Human-Computer Interaction* (John Wiley, 2007; reviewed in the August 2008 issue of *Technical*

Communication) and *Human-Computer Interaction*, by Alan J. Dix and colleagues (Prentice Hall, 2003). Shneiderman's original work predates both. The book's organization and writing are very clear and the text and figures well laid out and easy to follow.

The overall structure of the book remains identical to that of the fourth edition. There are four sections: an introduction to HCI, a discussion of the development and evaluation of interface designs, a long and detailed look at types of interaction styles, and an in-depth look at several specific design issues. The afterword includes the authors' perspective on the direction and controversies of the field.

For the most part, the fifth edition is an incremental update from the fourth. While the text incorporates small changes for grammar and clarity on nearly every page and many images have been updated, much of the text remains largely unchanged. That said, some areas of the book have been substantially rewritten. The chapter on software tools has been removed. The older chapter on information search and visualization has been split into two expanded chapters. The chapter on collaboration includes an extensive new discussion of social media. The chapter on user documentation now emphasizes the importance of online documentation. The afterword has been completely revised to describe some of the latest research directions and controversies.

Among the book's strongest points, even in its earliest editions, are the comprehensive reference lists. These lists have been thoroughly updated, both to drop out-of-date or older material and to add the latest papers and thinking.

The book is written primarily as a text for students and researchers, but the authors explicitly note that the book is designed to be useful as a reference for practitioners as well. Every chapter includes a "practitioner's summary" and "researcher's agenda" designed to give a brief summary of each chapter for the appropriate audience. Although practitioners will doubtless be more interested in some chapters than others, the introduction provides helpful hints on how to find the subjects most appropriate to a practitioner's field.

The companion Web site is geared toward students and instructors rather than practitioners, and parts of the site are not free. An extensive list of relevant links, discussion questions, and an infrequently updated blog are public. Students can gain access to self-assessment

quizzes, slides, and example projects using an individual code given with each book that allows for six months of access.

As a textbook, *Designing the User Interface* is a comprehensive and engaging introduction to the HCI field. While the book necessarily cannot cover every topic in enough detail to be a true practitioner's reference, the introductions to each topic and the related references may be of great value to the working professional.

Colin Birge

Colin Birge is a fourth-year doctoral candidate in the Department of Human-Centered Design & Engineering at the University of Washington. His research interests include usable privacy and security, rhetoric, HCI, and user-centered design. He is a former Microsoft program manager and continues to work as a consultant.

Beautiful Teams

Andrew Stellman and Jennifer Greene, eds. 2009. Sebastopol, CA: O'Reilly Media. [ISBN 978-0-596-51802-8. 482 pages, including index. US\$39.99 (softcover).]



When seeking out advice about software projects, it is tempting to turn to a book expecting to be told what to do: "If you read this book and follow the best practices, you will have a successful project." Andrew Stellman and Jennifer Greene, veteran software engineers and project managers, wrote *Beautiful Teams* with an

entirely different approach: "If you picked up this book hoping to find the *One Correct Way*TM to run a beautiful team, we're really sorry, because that's not what this book is about. But if you're looking to gain some insight into what makes a good team tick and what you can do to take a mediocre team and make it better—or take a great team and make it crash and burn—you're going to get a lot out of this book" (p. xviii).

Beautiful Teams includes stories and interviews in 31 chapters from software industry veterans representing a wide range of organizations, including Google, IBM, Microsoft, and NASA. Organized into four main parts (“People,” “Goals,” “Practices,” and “Obstacles”), the book starts with an interview with Tim O’Reilly (founder of O’Reilly Media, the well-known publisher of books on computer technologies) and ends with one on record producer Tony Visconti. Visconti may seem like an odd choice, but you will learn in this chapter that producing records and building software have a lot more in common than you might think.

It is important to be up-front in mentioning that *Beautiful Teams* is for a main audience of software developers and *not* technical communicators. The book is most relevant to technical communicators who work on a team with software developers, but having the rare chance (for a lot of us) to get a developer’s perspective may be a worthwhile education for any technical communicator. The assumptions by the authors when starting the project also make a case for reading: “the more you know about how different people run their projects, the better equipped you are to run your own” (p. xvi).

At more than 450 pages, *Beautiful Teams* is no quick or very easy read. I recommend *not* trying to read from cover to cover; start by reading only the chapters that interest you the most. How to decide which chapters to read? Carefully read the “How This Book Is Organized” section, which has short summaries of each chapter. Pay close attention to hints for topics that interest you, such as agile or open source. Also, this section can be a big help in ruling out sections *not* to read, such as industries that are in no way related to your work (examples: video games or defense/aerospace).

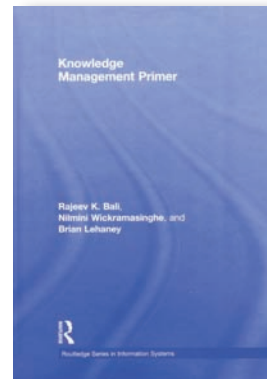
Beautiful Teams is clearly *not* required reading for all technical communicators, but for certain people, such as the technical communicator working on a software team with developers, a lot can be learned from reading about the experiences—both successes and failures—of others.

David Kowalsky

David Kowalsky is a technical writer for NEC Corporation of America. He received his MA in East Asian studies from Washington University (St. Louis) and a certificate of technical writing and editing from the University of Washington. He is a senior member of STC’s Puget Sound Chapter.

Knowledge Management Primer

Rajeev K. Bali, Nilmini Wickramasinghe, and Brian Lehaney. 2009. New York, NY: Routledge. [ISBN 978-0-415-99232-9. 135 pages, including index. US\$160.00.]



Knowledge Management Primer gives you a taste of what knowledge management (KM) is, along with ways to explore and apply KM strategies, tools, and techniques. KM is built on the “relevance of the data, the pertinence of the information and the germaneness of the knowledge” of the specific

context (p. 2). In a company, knowledge has tangible and intangible value toward the goal of collecting tribal knowledge before it walks away. Companies use KM to achieve and influence company goals by creating, sharing, and retaining a competitive edge to acquire knowledge and measure its assets.

Creating a knowledge architecture requires capturing knowledge in one of four knowledge spirals:

- Combination: Create knowledge from existing explicit knowledge resources.
- Externalization: Create knowledge from tacit knowledge
- Internalization: Create new knowledge from explicit knowledge
- Serialization: Create new tacit knowledge from existing tacit knowledge.

Knowledge exists in objective components (explicit or factual knowledge, written or documented) and subjective components (tacit or “know how,” undocumented information stored internally).

Capturing tacit knowledge includes conducting exit interviews, providing social networks and wikis, and using brainstorming techniques.

KM tools and techniques rely on ontologies and taxonomies, data mining where “descriptive and predictive tasks are carried out by applying different machine learning, artificial intelligence and statistical algorithms,” (p. 40) and business intelligence and analytics. Narrative (storytelling) may not be considered a KM tool, yet it does bring different data-based

sources together, providing qualitative research. Bali, Wickramasinghe, and Lehaney cite David Skyrme's and Debra Amidon's six knowledge types: know-how, know-who, know-when, know-where, know-why, and know-that. Next, there is External Structure Initiatives, Internal Structure Initiatives, and Competence Initiatives, which cover gaining knowledge, building a knowledge-sharing culture, and creating KM-based careers.

The authors review the concepts behind systems thinking (hard, soft, and critical) where KM is considered "the organization of parts and their dynamic relationships, that comprise a whole, rather than the study of static organizational parts" (p. 57). Hard-systems thinking looks at solving a problem by creating a structural system to achieve an intended outcome. It uses systems analysis and synthesis and does not work well with social or organizational problems. Soft-systems thinking explores the situation, determines what the problems are, and seeks to solve the situation. Critical-systems thinking considers the "individual, organizational, cultural, societal and political issues, and how these might be addressed and dealt within an organization" (p. 66) using a set of questions to determine motivation, power, knowledge, and legitimacy.

Knowledge affects a company's concepts of learning, culture, and organizational structure. The authors state that "the terms 'learning organization' and 'organizational learning' are not the same. The overlap occurs because organizational learning is a prerequisite for a learning organization" (p. 83). They summarize Skyrme's and Peter Senge's approaches:

- **Skyrme's four levels of learning:** learning facts, knowledge processes, and procedures; learning new job skills that are transferable to other situations; learning to adapt; and learning to learn.
- **Senge's five learning disciplines:** personal mastery, team learning, shared vision, mental models, and systems thinking.

Organizational culture should be shared, learned, passed transgenerationally, perceptually influenced, and adaptive. The book discusses Stephen Robbins' 10 organizational culture characteristics—individual initiative, integration, control, risk tolerance, direction, reward systems, communication patterns, conflict tolerance, management support, and identity—that show companies the importance of understanding that

knowledge is key to their success and organizational structure.

Organizational structure represents the company's heart with core values, rituals, heroes, symbols, and structures. Core values guide its progress. Rituals cover employee relations, followed by heroes who describe the employees and their competencies and behaviors. Symbols relate to the corporate image, while structures help control and guide the company's planned and coordinated activities.

Knowledge Management Primer is small, compact enough for use as a reference book or as an introductory KM course. It does have grammatical issues that may detract from understanding the concepts; tables are not directly referenced; and the overuse of "follows" that leaves the reader searching for the referenced graphic, table, or list. Technical communicators build a career on ensuring the accuracy of referenced items like these as we manage the knowledge provided to our audience.

Jackie Damrau

Jackie Damrau has more than 20 years of technical communication experience. She is a fellow and member of the STC Lone Star community and the Instructional Design & Learning SIG, manager of the Nominating Committee, and member of the Competitions Task Force. She enjoys reading philosophy and psychology besides spending time with her grandson.

Online Communities Handbook: Building Your Business and Brand on the Web

Anna Buss and Nancy Strauss. 2009. Berkeley, CA: New Riders. [ISBN 978-0-321-60588-7. 271 pages, including index. US\$34.99 (softcover)].



Anna Buss and Nancy Strauss have written a book about building your business and brand on the Web. Technical communicators will find the book useful because companies are seeking to develop their own online communities, and technical communicators can play a key role in bringing those communities to life.

The book begins with an explanation of what an online community is. The authors define it as “a group of people who regularly interact with each other on a website” (p. 4). At first, this seems to be a broad definition. However, the authors explain that wikis, blogs, and message boards do not count as online communities, because they focus on a particular posting or thread of postings about a particular topic. An online community, by contrast, focuses more on the relationships between members of the community. The book then describes what online communities can do for your company, setting up your community, member recruitment and motivation, managing your community, monetizing your community, and growing your community.

The book is logically organized with plenty of examples that explain or show how other organizations have created and managed their own online communities. The examples provide good food for thought when you start thinking about creating an online community for your organization.

Online communities benefit both a company and its customers in several ways. The company benefits by staying in touch with its customers, providing product and service information, and selling products. Customers benefit by sharing feedback with the company and with other customers.

Technical communicators, thanks to their knowledge of the company, its products and services, its customers, and how to design and publish information, make a difference because they can lead in designing and managing such communities.

George Slaughter

George Slaughter is an STC senior member and a former STC Houston president.

From Design Into Print: Preparing Graphics and Text for Professional Printing

Sandee Cohen. 2009. Berkeley, CA: Peachpit Press. [ISBN 978-0-321-49220-3. 314 pages, including index. US\$34.99 (softcover).]



From Design Into Print is a redesign of *The Non-Designer's Scan and Print Book* (Peachpit Press, 1999), updated for new technologies and concepts. Concepts such as scanning, for example, needed to be covered in less detail, while working with digital cameras needed its own chapter.

You should read the five sections in order. The beginning chapters, in particular, cover knowledge that builds a foundation for understanding in later chapters. Specific software applications are not recommended or required, but types of software are recommended for different types of projects.

The section “Start at the End” teaches you that you need to know where you’re going (your end product, with its particular choices of paper and colors), how you are going to get there (project preparation), and the basics of commercial and desktop printing.

Cohen then helps you understand the types of computer applications, computer color modes, raster images, vector images, and file formats. Those not-so-minor details can trip you up later in the process if you haven’t considered them beforehand.

“The World of Color” gets into process color printing, spot colors, and duotones and explains how many colors to print. The book itself is printed in four colors.

Cohen describes “Getting Stuff into the Computer” by looking closely at several technologies, including digital cameras, scanners, stock photos and clip art, and fonts. She devotes one chapter to each technology, providing sufficient detail for the non-designer.

Finally, Cohen goes into what needs to happen after all the design work is done. She focuses on high-resolution output, Acrobat and PDF files, output specifications, trapping, and preflight and proofing. One appendix includes a handy sample preflight

checklist; the other appendix is a glossary of common terms used by print providers and production managers.

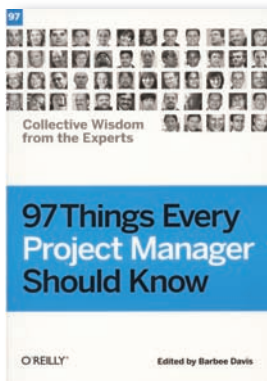
From Design Into Print is a very useful reference book. The text is conversational but not folksy. Easy to read and understand, the book wouldn't be out of place in an introductory course on graphic design projects.

Rachel Houghton

Rachel Houghton has more than 13 years of technical communication experience. She is a senior member of the STC Willamette Valley and Lone Star communities and program chair of the 2010 STC Tech Comm Summit in Dallas, TX. She enjoys photography, Photoshop, and creatively expressing her design talents through digital scrapbooking.

97 Things Every Project Manager Should Know: Collective Wisdom from the Experts

Barbee Davis, ed. 2009. Sebastopol, CA: O'Reilly. [ISBN978-0-596-80416-9. 232 pages, including index. US\$29.99 (softcover).]



Project management is part of any activity, whether it is as simple as planning work to get away at noon for a luncheon appointment or as complex as planning a software suite for a valued client. Indeed, the processes involved are the same and differ only in granularity.

For project management beginners there are numerous

books, Web sites, webinars, seminars, and academic courses that can make what, to some, looks like arcane black magic become exercises in logical decomposition of an activity. *97 Things Every Project Manager Should Know* is not for a beginner. It is for experienced project managers looking to learn what other, similarly qualified managers have learned. Even though the editor slips in an occasional footnote explaining some project management term, the reader is assumed to know the processes involved in developing a project plan.

According to the publisher's blurb, this is the first in a new series of books, each providing 97 hints on a particular aspect of documentation. The 97

hints or tips in this book come from 53 authors who manage software development projects in the United States and 10 other countries. They are consultants, academics who also consult, academics who are also company employees, and company employees; most are professional project managers, and their advice ranges from the general to the specific.

Barbee presents each hint in a two-page spread. The hints are not arranged in any discernible order, and the editor's preface is silent on both how she organized the book and how she selected the entries. She tells us that they came in response to a post on the Internet and she selected from them.

Even though there is no clear organizational pattern, the book works because of a strong topic table of contents. You can easily locate hints on agile methods of management, managing people and teams, distributed teams, communications, project processes, and so forth. As for the hints themselves, they are rather uneven, with some rather elemental and others advanced. The hints' focus on software development makes it difficult but not impossible for project managers of other types of projects to draw benefits from reading and "translating" them to their subjects. The editor allowed authors free range of topics, but would have served her readers better if she had provided at least some talking points for each to cover.

Some of the hints leave the reader wondering about specifics. For example, a hint called "Keeping Your Perspective," which addresses project business requirements, suggests asking stakeholders a series of questions. Sample questions would save the reader the trouble of wondering what kinds of questions and then how to integrate the answers into the project plan.

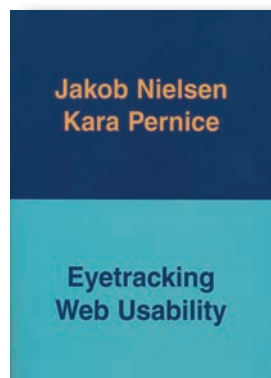
Because most hints focus on the three variables project managers always have to balance—time, budget, and quality—they are usable and valuable. The caveat is that if you are not in software development, you will need to adjust the discussions to your own particular subject.

Tom Warren

Tom Warren is an STC Fellow, a winner of the Jay R. Gould Award for teaching excellence, and professor emeritus of English (technical writing) at Oklahoma State University, where he established the BA, MA, and PhD technical writing programs. Past president of INTECOM, he serves as guest professor at the University of Paderborn, Germany.

Eyetracking Web Usability

Jakob Nielsen and Kara Pernice. 2010. Berkeley, CA: New Riders. [ISBN 978-0-321-49836-6. 437 pages, including index. US\$59.99 (softcover).]



Eyetracking shows us what people are looking at—and not looking at—when they work on a computer screen. It's not a new methodology, but modern equipment allows us to use eyetracking much less obtrusively than was possible years ago. This less obtrusive eyetracking has become popular in usability studies, but it

still requires special equipment, so not everyone is doing it. Many people, however, would be interested in what eyetracking tells us about how visitors use Web sites. That's the subject of *Eyetracking Web Usability*.

As with Jakob Nielsen's earlier book, *Prioritizing Web Usability* (reviewed by Ginny Redish in the February 2007 issue of *Technical Communication*), *Eyetracking* is based on an extensive research study. Nielsen, Pernice, and their colleagues at the Nielsen Norman Group watched more than 300 people doing one or more of 85 tasks, some very specific and some open-ended, across a wide range of sites. Furthermore, this study, like the earlier one, has great credibility because it meets Caroline Jarrett's criteria for studies that practitioners can use: representative users (not university students), realistic tasks, and real sites (*Journal of Usability Studies*, November 2007). Nielsen and Pernice list the sites that study participants went to, and they explain that realistic tasks means having people go through the entire experience, not just seeing what users do on one page of that experience. As Nielsen and Pernice explain,

There's a tension between eyetracking studies and real user behavior. Eyetracking records behavior within a single page, but Web usability is dominated by movement between pages. The way to resolve this tension is to conduct eyetracking studies with users who are navigating normally because they are using the Web to perform a realistic task. Only then can you get

realistic data about how people look at each of the pages they encounter. (p. 37)

Based on this research study, *Eyetracking Web Usability* covers what Nielsen and Pernice learned about page layout, page organization, navigation, images, ads, and other fundamental Web elements.

Technical communicators will immediately notice what is missing from this list: content and reading. This is a huge disappointment and makes the book much less useful than it would otherwise be for many technical communicators, copywriters, content strategists, and others who help with the critical element of content and writing on the Web.

Nielsen and Pernice tell us early in the book that "Despite our tight focus, the manuscript for this book got bigger and bigger as we were writing....To keep this book at a manageable size, we cover two topics in separate reports instead of discussing them [in the book]" (p. xvi). The two topics are methodology and how people read. The report on methodology is available free at <http://www.useit.com/eyetracking/methodology/>. The report on how people read is also listed in the book with a URL but was not yet available as this review was being edited. However, the URL only promises the report in the future and does not indicate how much it will cost.

Despite the flaw of not covering reading, *Eyetracking Web Usability* is full of fascinating and useful findings. A few that may interest technical communicators are

- Chunking, using bold or colored headings, and setting the heading and its chunk off from others with space saves users time.
- Sassy, cute links that do not match users' words don't work.
- People who are doing a task just don't look at those large pictures that dominate many Web sites' home pages.
- If an ad or a large picture comes between the page title and the content, people are not likely to notice the page title.
- These adult study participants often chose the kids' Web pages at a site or stayed on the kids' pages if they happened upon them. Nielsen and Pernice hypothesize that this happened because the text and images on those pages make difficult information easy to understand.

The book is also a pleasure to use. *Eyetracking Web Usability* has the same layout as *Prioritizing Web*

Usability—large type, good line length, full color, screenshots on almost every page, separate boxes with guidelines, and a clear writing style.

In a two-page appendix, Nielsen and Pernice summarize how much people looked at specific Web elements. This table gives percentages for navigation elements, images, and ads. It breaks each of these categories into quite specific elements, giving separate percentages, for example, for shopping cart in upper-right quadrant and shopping cart in upper-left quadrant; for images with a single person and images with multiple people; for text ads, different types of graphical ads, and animated ads. However, once again, they leave out all the elements related to Web content: There are no percentages for headings, paragraphs compared with bulleted lists, short paragraphs compared with long paragraphs, and so on.

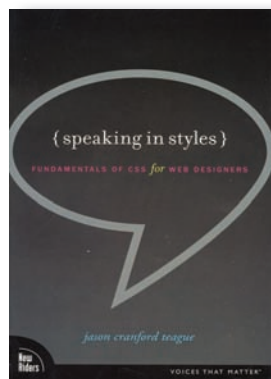
If you are interested in what eye-tracking over many users, many tasks, and many sites shows about how people use home pages, navigation elements, images, and ads, *Eyetracking Web Usability* is a book to get.

Janice (Ginny) Redish

Janice (Ginny) Redish is President of Redish & Associates in Bethesda, MD. Ginny is an STC Fellow and former member of STC's Board of Directors. Her latest book, *Letting Go of the Words—Writing Web Content That Works* (Morgan Kaufmann, 2007), is still receiving rave reviews on book sites and in blogs.

Speaking in Styles: Fundamentals of CSS for Web Designers

Jason Crawford Teague. 2009. Berkeley, CA: Sage. [ISBN 978-0-321-57416-9. 360 pages, including index. US\$44.49 (softcover).]



Speaking in Styles: Fundamentals of CSS for Web Designers, by Jason Crawford Teague, is intended for just that: an audience that already knows HTML and is already at work designing Web pages. As such, it doesn't waste time discussing HTML or Web design in general. Instead, Teague begins by

explaining the advantages of using Cascading Style Sheets (CSS) for stylistic elements on Web pages and reserving HTML for structural concerns only.

Once Teague makes his case for CSS, he moves into the nitty-gritty details of the syntax, semantics, grammar, and vocabulary specific to CSS. The chapters move in a logical progression of general information about CSS to specific instances where one might override a rule to break inheritance or to work around a noncooperative browser.

The discussion in *Speaking in Styles* is concise yet easy to understand for a designer who is already familiar with HTML. Teague's language is clean and free from the "hipster" lingo that clouds the readability of many similar texts. In addition, much of his presentation of the information is novel; for instance, I have never seen a detailed discussion of how HTML, CSS, and Javascript interact before, yet it is essential information that most high-level designers understand and use every day. *Speaking in Styles* also presents the most thorough discussion of the most popular browsers and how they interact with CSS that I have ever seen, even though some of it is already outdated. For example, Teague discusses Internet Explorer 6 and mostly omits Internet Explorer 8 and other, newer browsers such as Google Chrome. Despite this, Teague gets an A+ for his discussion of CSS concepts, and the beautiful examples of Web pages using CSS really motivate the beginning designer.

Where Teague's book falls short is that there is a lot of explanation of CSS in terms of what it does, how the rules are structured, and its shortcomings and advantages over merely using HTML, but it does not show enough practical detail or examples of how CSS works in reality. It is one thing to discuss specificity (how the browser decides which CSS rules to apply and when) in theory, but it is quite another to actually write the rules and see for yourself how the principle of specificity works.

If *Speaking in Styles* included exercises to help the reader visualize the concepts and how they actually work in practice, I would say that this is the best book out there for Web designers who are new to CSS. Because it lacks this element, I would argue instead that it is an invaluable companion guide to another, more comprehensive text such as *Head First HTML with CSS & XHTML* (O'Reilly Media, 2006). Even though *Speaking in Styles* cannot realistically stand on its own for a designer beginning to learn CSS, its clean organization, illustrative full-color examples, and

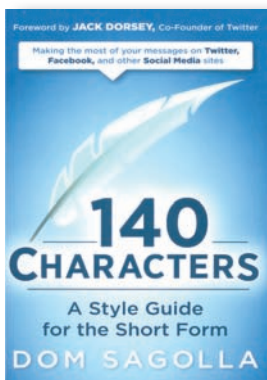
user-friendly explanations make it a must-have reference for this audience.

Nicole St. Germaine-McDaniel

Nicole St. Germaine-McDaniel is a senior member of STC and chair of the Technical and Business Writing Program at Angelo State University. Her research interests include technical communication for a Mexican-American audience and technical communication in the health fields.

140 Characters: A Style Guide for the Short Form

Dom Sagolla. 2009. Hoboken, NJ: John Wiley & Sons Inc.. [ISBN 978-0-470-55613-9. 178 pages, including index. US\$17.95 (softcover).]



There probably is no better person to write this book than the author, Dom Sagolla. Between involvement in the birth of twttr (better known as Twitter), the perspective of a self-avowed English major, and a desire to keep up with the latest software technologies, @dom (the author's user name) has

clearly fallen in love with the electronic short form.

The book is broken down into five sections with 19 short chapters, each titled as a single verb or noun. A ballooned tweet illustrates nearly every paragraph in the book, each from the author's extensive collection gathered over years of twittering and following other tweeters. In case you tire of interpreting the nuances of each tweet, you can stick to the written text and still learn a great deal about this emerging art form.

The introduction details the origins of Twitter, a tool originally designed to use the short message service protocol (SMS) for quick communication. In the chapter "Link," Sagolla breaks down the anatomy of a single message into its technical parts: an SMS is sent, an API notification is sent, an e-mail is sent, most URLs are shortened, and a Web page is created. "Simplify" explains innovations such as the @username (identifies a user) and the #hashtag (defines a topic).

The chapters "Voice" and "Word" reveal the author as a true lover of the written word. He identifies established short forms, such as haiku or couplet, with tweets to demonstrate. He even points out that a sonnet, requiring 14 lines with 10 syllables per line, could be a tweet, although he has yet to see such a one. Invention of new words is popular among tweeters. For instance, Sagolla's glossary shows current examples using portmanteau: linner (lunch and dinner) and impossible (impossible and improbable).

"Link" emphasizes the power of hypertext in the short form. First, the author claims that "Twitter is the world's easiest and fastest way to produce hypertext" (p. 71). He explains the three dimensions of text in this form: character (includes grammar, spelling, syntax, and shapes), line (negative space), and link. A single word can be linked to include "nearly infinite possibility and meaning" (p. 72).

Sagolla provides guidelines for using Twitter and an explanation of its uniqueness: "Facebook is for people you already know, and Twitter is for people you want to know" (p. 32). Other chapters cover social and psychological issues such as etiquette (caps-lock text used in moderation), addiction to tweeting (for example, several teenagers sitting on a couch texting rather than talking), and seeking praise from large followings (followings are a tweeter's way to read other authors and vice versa).

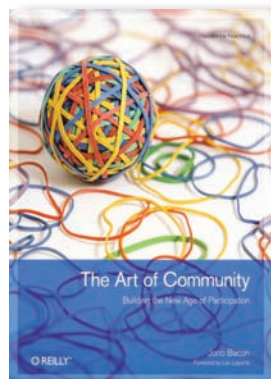
Technical writers, who have already learned the economy of words, should be able to appreciate a form that encourages young people to write and learn to do it concisely. This book provides excellent basics for any who may have slept through high school English.

Donna Ford

Donna Ford is current president of the Connecticut STC chapter. She has been a technical writer since 1987 in the hardware, software, and government health care industries.

The Art of Community: Building the New Age of Participation

Jono Bacon. 2009. Sebastopol, CA: O'Reilly Media, Inc. [ISBN 978-0-596-15671-8. 366 pages, including index and bibliography. US\$39.99 (softcover).]



The Art of Community might at first glance look like hard reading about a boring topic, but I found it a pleasant surprise from the first page. Both Leo Laporte, who wrote the foreword, and Jono Bacon have a fun and engaging writing style. Dots (with personalities!) are used to illustrate the essence of community early on, and

amiable dialogue provides informative, yet engaging, guidance throughout.

Bacon carries his community theme from start to finish. According to the preface, you can actively participate in the community at <http://www.artofcommunityonline.org> in several ways:

- Follow links to download the book (with corrected errata).
- Write a review.
- Get related news.
- Chat with other readers.
- Read articles.
- Leave feedback.

However, when I checked on 15 April 2010, the last activity was by the author on 22 December 2009. Perhaps the book hasn't been out long enough to encourage community participation. Fortunately, the book itself maps out a usable blueprint for creating and maintaining successful communities.

The first third of the text deals with the basics of starting a community, and the rest primarily covers operational, maintenance, and legal aspects. Emphasis is put on proper planning, unity, communication, and mediation. The advice offered throughout is garnered from personal, corporate, and civic experience and can be used for both large and small groups. Bacon is known for building computer open source communities

(LugRadio and Ubuntu), but his book applies to all types of organizations.

If you belong to or plan to start a professional, civic, volunteer, commercial, computer/IT, or activist group, this book is packed with constructive information. Begin with setting up a community; the principles can be applied to associations as varied as a church group, a civic community council, a volunteer organization, and a company office. The basic principles are the same no matter the size, although as your group grows or shrinks, some requirements do change. Larger groups have more need for governance and community management, but all groups require good communication, a sense of belonging, a sense of purpose, contributing members, and more.

The Art of Community explains these critical factors, describes how to achieve them, discusses mistakes to avoid, and presents real-life examples of how organizations solved similar problems. Wondering how to build a mission statement? Covered. Want to discover essential building blocks of belonging for team building? Covered. Need to settle conflict? Covered. You get the idea—Bacon has done his homework and anticipated most issues you might encounter or need to consider in a community endeavor.

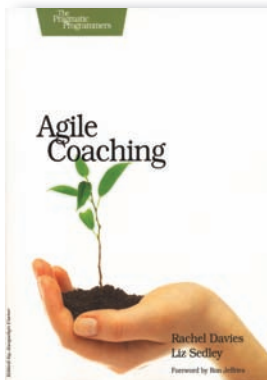
This is one of those rare books that delivers what it promises. It is also well organized and well written, and it could easily become a community member's or manager's dog-eared resource.

Sherry Shadday

Sherry Shadday works for Southwest Research Institute as a principal instructional specialist creating print, stand-up, and Web-based training in Layton, UT. An STC member, she received a technical communication master's degree from Utah State University and previously served 21 years in the U.S. Air Force maintaining aircraft electrical systems.

Agile Coaching

Rachel Davies and Liz Sedley. 2009. Raleigh, NC: The Pragmatic Bookshelf. [ISBN 978-1-93435-643-2. 221 pages, including index. US\$34.95 (softcover).]



I admit I was excited when I received my review copy of *Agile Coaching*, by Rachel Davies and Liz Sedley. Excited because several of my colleagues have been enthusiastic about how effective this approach has been on their projects, and I wanted to learn more about the process and its applicability to the types of

projects handled by my company. Specifically, I wanted to learn what the Agile process is, whether it will apply to my workload, and how to be a better manager of my team members.

This easy-to-read book—you can read it in the span of a cross-country flight—makes a straightforward promise: “You’ll learn how to build a team that produces great software and has fun doing it” (back cover). The authors deliver by sharing what has and has not worked for them over the years. They discuss possible pitfalls and provide guidance to avoid and overcome them. These recognized leaders in the Agile community share their personal and observed experiences (they consult with companies to successfully integrate the Agile process into the corporate workflow). If you’re learning about the Agile process or find yourself coaching an Agile team, you’ll want to read this book.

Beyond discussing the process, the authors hone in on how you can become an effective coach by breaking the method into logical and discrete segments, starting with defining the coach’s role in the process and moving through creating your team, facilitating development with your team, keeping your projects moving, maintaining a quality product, and observing results to improve the process for the next project or iteration.

The text is organized very effectively. Each chapter offers pertinent information about possible difficulties you may encounter as well as a checklist of best practices in working with and guiding your team throughout the process. These lists transform the book from a one-time read to a resource you will likely consult often as

you manage your projects. This focused content make the book worthy of its \$34.95 cover price. (Electronic versions are also available through the publisher.)

The authors embrace readers who have little or no knowledge about the Agile environment. They provide a clear picture of when the method is best used while addressing concerns of those who have an established team. After reading this book, you will have a base understanding of the process that will allow you to determine if it is the best approach to your specific projects.

Davies and Sedley provide sound principles of effective project management and developing teams that apply in general to any project team—Agile or not. Their attention to the full scope of their audience makes this a valuable book for any team member’s or manager’s bookshelf.

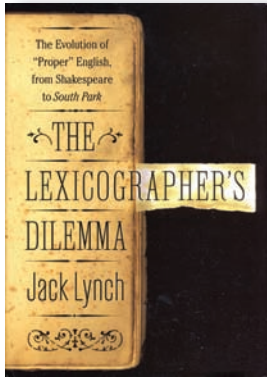
By the time I reached the detailed end matter of the book, I had developed a good understanding of the Agile process and whether it would work for the typical project in my company. While we won’t be embracing the Agile process in its entirety, I was able to glean valuable information that I immediately integrated into existing projects and team management. As a result, I’ve witnessed my team working together more effectively and have experienced increased productivity and quality in our projects.

Louellen S. Coker

Louellen S. Coker has more than 15 years of experience in public relations, instructional design, Web design, technical writing, and editing. With a technical communication MA, she is president of Content Solutions, an STC senior member, and a past Lone Star Community president. She has taught technical communication and presented workshops.

The Lexicographer's Dilemma: The Evolution of "Proper" English from Shakespeare to *South Park*

Jack Lynch. 2009. New York, NY: Walker & Company. [ISBN 978-0-8027-1700-9. 326 pages, including index. US\$26.00.]



The English language changes constantly. And ideas about what constitutes standard English change with it. Even experts can't agree on what is acceptable. To some, language change indicates social decay. Others welcome new words into the living language. Yet someone must pin down words, their spellings, and their meanings

to create a useful guide to speaking and writing the language. This is the job of the lexicographer.

In *The Lexicographer's Dilemma: The Evolution of "Proper" English from Shakespeare to South Park*, Jack Lynch, professor of English at Rutgers University, traces the history of the English language dictionary. Beginning with the seventeenth century, he provides a chronology of dictionary making in England and the United States, while introducing readers to the lexicographers, the "people who have surveyed the state of the English language, didn't like what they saw, and resolved to do something about it" (p. 5).

Lynch also examines the challenges these lexicographers faced. For centuries, compilers of English language dictionaries have struggled to present collections of words and definitions that represent the language appropriately. But throughout the dictionary's development, there have been disagreements, often emotionally charged, about the dictionary's purpose. Lynch identifies two kinds of lexicographers: the prescriptivist and the descriptivist. Prescriptivists claim to know which words English speakers *should* use, defending their dictionaries as the authority on the language. Descriptivists survey the language, then report on and describe the words actually *in* use. These two camps don't agree on the purpose of a dictionary, but they all face the same questions: "What does *proper* English mean, and who gets to say what's right?" (p. 1).

There's a lot for technical communicators to like about *The Lexicographer's Dilemma*: discussions of writing styles and dos and don'ts of grammar, insights into how technology (from the printing press to text messaging) affects the language, and revelations about words. Above all, it's the words that fascinate. Lynch sheds light on the origins of many words and categories of words, how they fell in and out of favor, the social trends that have influenced lexicographers, and the reactions these dictionary makers have encountered. Even as late as the 1960s, for example, Merriam-Webster was severely criticized for adding *astronaut* and *finalize*, words that we now routinely accept as part of the language.

As a writer, I appreciate most that Lynch maintains a certain amused detachment from the word wars and comes down on the side of "grace and clarity" (p. 275) in language, regardless of whether the prescriptivists or the descriptivists rule in the latest editions of their dictionaries.

Linda M. Davis

Linda M. Davis is an independent communications practitioner in the Los Angeles area. She holds a master's degree in communication management and has specialized in strategic communication planning, publication management, writing, and editing for more than 20 years. Linda is also a member of IABC.

Sherry Southard, Editor

The following articles on technical communication have appeared recently in other journals. The abstracts are prepared by volunteer journal monitors. If you would like to contribute, contact Sherry Southard at southards@ecu.edu.

"Recent and Relevant" does not supply copies of cited articles. However, most publishers supply reprints, tear sheets, or copies at nominal cost. Lists of publishers' addresses, covering nearly all the articles we have cited, appear in *Ulrich's International Periodicals Directory*.

Thanks to J. A. Dawson, who helped me assemble the manuscript for "Recent & Relevant."

Collaboration

Leadership roles, socioemotional communication strategies, and technology use of Irish and U.S. students in virtual teams

Flammia, M., Cleary, Y., & Slattery, D. M. (2010). *IEEE Transactions on Professional Communication*, 53, 89–101.

"Global virtual teams provide numerous benefits for corporations employing virtual organizational forms and for individual teams and team members. However, virtual collaboration also presents some well-recognized challenges. A growing body of research has examined the process of virtual teaming and the challenges inherent in that process. This study seeks to address some of the gaps in the existing literature. Specifically, it examines leadership roles, socioemotional communication strategies, and the use of technology to establish relational links among team members. The study focuses on virtual-team collaboration among technical communication students at the University of Limerick, Limerick, Ireland, and at the University of Central Florida, Orlando, Florida."

Gowri Saraf

Managing the multiple meanings of organizational culture in interdisciplinary collaboration and consulting

Dixon, M. A., & Dougherty, D. S. (2010). *Journal of Business Communication*, 47, 3–19.

"Kuhn reminds us that although collaborating researchers in different disciplines may observe the same phenomena and use similar terms to describe it, their articulation of their findings can be radically dissimilar. Pointing out that what we see is largely dependent on what we have been trained to see, Kuhn cautions that individuals from two academic disciplines who work together will find themselves 'always slightly at cross purposes.' Consequently, even though consultants and clients may use the same word, the meaning of the word may be quite different. Such differences often affect the entire consultation process including the client's expectations, as well as their willingness to accept the consultant's recommendations. This article is a case study of the authors' experiences when they were asked to engage in a cultural assessment of a student affairs department at a large Midwestern University."

J. A. Dawson

Communication

Beyond persuasion: The rhetoric of negotiation in business communication

King, C. L. (2010). *Journal of Business Communication*, 47, 69–78.

“This essay describes and provides a rationale for the Rhetoric of Negotiation as a useful frame for what is typically considered persuasion in business communication. It argues for a broader understanding of the opposition and draws from Eckhouse’s work on business communication as a competitive activity as well as Booth’s concept of Win-Rhetoric versus Listening-Rhetoric. Using illustrations from the author’s previous research, this commentary proposes that the Rhetoric of Negotiation is useful in business communication for both ethical and practical reasons.”

J. A. Dawson

Cognitive organization and identity maintenance in multicultural teams: A discourse analysis of decision-making meetings

Aritz, J., & Walker, R. C. (2010). *Journal of Business Communication*, 47, 20–41.

“Measuring culture is a central issue in international management research and has been traditionally accomplished using indices of cultural values. Although a number of researchers have attempted to identify measures to account for the core elements of culture, there is no consensus on those measures. This article uses an alternative method—discourse analysis—to observe what actually occurs in terms of communication practices in intercultural decision-making meetings, specifically those involving U.S.-born native English speakers and participants from East Asian countries. Previous discourse studies in this area suggest that differences in communication practices may be attributed to power differentials or language competence. Our findings suggest that the conversation style differences we observed might be attributed to intergroup identity issues instead.”

J. A. Dawson

Do their words really matter: Thematic analysis of U.S. and Latin American CEO letters

Conaway, R. N., & Wardrope, W. J. (2010). *Journal of Business Communication*, 47, 141–168.

“This study compares the annual report letters written by the CEOs of 30 U.S.-based companies and 24 Latin American-based companies listed on the New York Stock Exchange. Using a grounded theory approach, the authors thematically analyzed both sets of letters to ascertain common topics, stylistic (writing) features, and embedded cultural attributes. They found that although both sets of letters share much regulatory and financial information, the Latin American letters are characterized by a richer mix of topics, a more complex writing style, and evidence of cultural dimensions as conceptualized by the research of scholars such as Geert Hofstede and Edward T. Hall. Their work is founded on the belief that corporate documents exist to communicate more than factual information to their constituencies. Rather, the purpose of corporate writers is to influence public opinion and attitudes, particularly among potential investors, in ways that create support for organizational practices or undermine opposition to them.”

J. A. Dawson

The effects of supervisors’ verbal aggressiveness and mentoring on their subordinates

Madlock, P. E., & Kennedy-Lightsey, C. (2010). *Journal of Business Communication*, 47, 42–62.

“This study examined the association between supervisors’ mentoring and verbal aggression and their subordinates’ perceived communication satisfaction, job satisfaction, and organizational commitment. The findings of the 200 full-time working adults who participated in the study supported prior research indicating positive relationships between mentoring behaviors by supervisors and their subordinates’ communication satisfaction, organizational commitment, and job satisfaction, and negative relationships between supervisors’ verbal aggression and their subordinates’ communication satisfaction, organizational commitment, and job satisfaction.”

Results of a regression analysis indicated that supervisors' verbal aggression was a greater negative predictor of subordinates' outcomes than was mentoring a positive predictor, supporting the presence of a negativity bias in the supervisor-subordinate relationship. Additionally, path analysis indicated that communication satisfaction fully mediated the relationship between supervisor mentoring and subordinate organizational commitment, whereas communication satisfaction served as a suppressor between mentoring and subordinate job satisfaction."

J. A. Dawson

Examining the role of the communication channel interface and recipient characteristics on knowledge internalization: A pragmatist view

Scott, C. K., & Sarker, S. (2010). *IEEE Transactions on Professional Communication*, 53, 116–131.

"This paper evaluates the role of reprocessability and symbol sets, two of the media capabilities identified in Media Synchronicity Theory, and different recipient characteristics on knowledge transfer. An experimental study manipulating the two specific channel interface characteristics was conducted to test the proposed model. Results indicate that symbol sets have a positive effect on knowledge possessed and knowledge applied. Motivation to learn significantly affected knowledge possessed and knowledge applied, while absorptive capacity was found to only influence knowledge possessed. The hypothesized relationships between reprocessability and knowledge internalization were marginally supported, and future research is suggested to address this issue."

Gowri Saraf

Generation Y adoption of instant messaging: An examination of the impact of social usefulness and media richness on use richness

Anandarajan, M., Zaman, M., Dai, Q., & Arinze, B. (2010). *IEEE Transactions on Professional Communication*, 53, 132–143.

"By integrating Media Richness Theory, Channel Expansion Theory, and the Technology Acceptance

Model (TAM), we study the postadoption use behavior of instant messaging. We developed the construct 'use richness' as a measure of the extent to which users use the media communication capacity after adoption and proposed a conceptual model of the antecedents of use richness. Through a field survey with 272 valid responses and structural equation modeling, we empirically tested our model and found that use richness is positively affected by perceived media richness, perceived usefulness, and perceived social usefulness."

Gowri Saraf

The influence of high- and low-context communication styles on the design, content, and language of business-to-business Web sites

Usunier, J., & Roulin, N. (2010). *Journal of Business Communication*, 47, 189–227.

"Language and communication, especially high-versus low-context communication styles, have been shown to lead to differences in Web sites. Low-context communication provides the lowest common denominator for intercultural communication through the Internet by making messages linear, articulated, explicit, and therefore easier to understand in the absence of contextual clues. Based on theories of intercultural business communication and recent empirical studies, this article investigates how communication styles influence Web site design and content. It is hypothesized that, for the global audience, Web sites from low-context communication countries are easier to find, use colors and graphics more effectively, make navigation more user-friendly, contain more corporate and product information cues, and offer more contract- and relationship-related content than Web sites from high-context communication countries. This article also contributes to international business communication by investigating the choice of languages in business-to-business (B2B) Web sites. Empirical findings confirm the influence of high- versus low-context communication styles through systematic content analysis of 597 B2B Web sites in 57 countries. High-context communication style may be detrimental to the design of global Web sites, making them less readable, less effective in their use of colors and

graphics, and less interactive for the globally dispersed users.”

J. A. Dawson

Language policies and communication in multinational companies: Alignment with strategic orientation and human resource management practices

Van den Born, F., & Peltokorpi, V. (2010). *Journal of Business Communication*, 47, 97–118.

“This article focuses on the degree of alignment among multinational company (MNC) strategic orientation, human resource management (HRM) practices, and language policies. On the one hand, the authors propose that the coherent, tight alignment among the HRM practices, language policies, and MNC strategic orientation, in terms of ethnocentricity, polycentricity, or geocentricity, is beneficial. On the other hand, they use international business research on language in MNCs to illustrate that what is good in theory is often more difficult in practice. For example, HRM practices and language policies in foreign subsidiaries may not be tightly aligned with the corporate-level activities, and some hybridization tends to occur, for example, because of contextual reasons in host countries.”

J. A. Dawson

Education

A comparison of engineering students' reflections on their first-year experiences

Meyers, K. L., Silliman, S. E., Gedde, N. L., & Ohland, M. W. (2010). *Journal of Engineering Education*, 99, 169–178.

Although this study does not focus specifically on technical writing courses, it provides context for what engineering students experience during their first year, when they may complete those courses. “The introduction of a mentoring program at the University of Notre Dame in which upperclass engineering students serve as a resource to first-year students was the focus of this study. A retrospective survey was

administered to classes of sophomores and juniors The survey was focused on impressions of the first-year engineering experiences motivated by a desire to assess the new program. This assessment was used to address research questions relating to students' comfort approaching faculty/upperclass students and transition Findings indicate: (1) students are more comfortable approaching upperclass students than faculty for advice in many situations, (2) no measurable student benefit could be concluded as a result of the mentoring program introduction, (3) gender differences exist in terms of a student's comfort with their decision to stay in engineering, and (4) gender was not a statistically significant factor in predicting adjustment to engineering Results support continued focus on increasing academic confidence in women and men entering engineering programs to support the adjustment to engineering. The affinity of students for obtaining advice from more experienced students rather than faculty suggests that support programs such as mentoring should aide that adjustment, yet it is clear that the success of such programs is sensitive to conditions that are not easily controlled.”

Sherry Southard

Constructive interference: Wikis and service learning in the technical communication classroom

Walsh, L. (2010). *Technical Communication Quarterly*, 19, 184–211.

“Four service-learning projects were conducted in technical communication courses using wikis. Results confirm previous findings that wikis improve collaboration, help develop student expertise, and enact a ‘writing with the community’ service-learning paradigm. However, wikis did not decenter the writing classroom as predicted by previous work. Instructors using wikis to scaffold client projects should calibrate standards for evaluation with students and client, and they may need to encourage clients to stay active on the wiki.”

Valerie J. Vance

Developing technical communication education for Chinese industry professionals: Preliminary findings and suggestions

Yu, H. (2010). *IEEE Transactions on Professional Communication*, 53, 102–115.

“Existing literature argues, in general terms, that China has a growing need for technical communication and technical communication education. Following up on these studies, this paper more closely examines China’s needs for technical communication education. Based on interviews with industry professionals and reviews of their writing samples, this paper seeks to find out who among the industry professionals in China needs technical communication, what their communication practices are, the areas in which they need education, and what U.S. technical communication professionals can do to help develop this education. Preliminary findings and suggestions as well as topics for future research are presented.”

Gowri Saraf

Does business writing require information literacy?

Katz, I., Haras, C., & Blaszczynski, C. (2010). *Business Communication Quarterly*, 73, 135–149.

“Although the business community increasingly recognizes information literacy as central to its work, there remains the critical problem of measurement: How should employers assess the information literacy of their current or potential workers? In this article, we use a commercially available assessment to investigate the relationship between information literacy and the key business communication skill of business writing. Information literacy scores obtained prior to instruction predicted performance in an undergraduate, upper-division business writing course. Similar results emerged regardless of whether participants considered English their best language.”

J. A. Dawson

Foregrounding positive problem-solving teamwork: Awareness and assessment exercises for the first class and beyond

Rehling, L. (2010). *Journal of Business and Technical Communication*, 24, 234–244.

“In an advanced technical and professional writing course, a pair of in-class exercises integrates the teaching of teamwork with other class topics of project management and observation-based research. The first exercise introduces teamwork in a positive way, by raising awareness of strategies for solving problems successfully. The second exercise follows up on the first, focusing on assessment of problem-solving teamwork. The pair of exercises is memorable and effective, showing students in an engaging, thought-provoking way that they have control and responsibility for the success of their teamwork. The materials for conducting the exercises, provided here, encourage reflection and discussion.”

Kimberly C. Harper

Listening to students: A usability evaluation of instructor commentary

Still, B., & Koerber, A. (2010). *Journal of Business and Technical Communication*, 24, 206–233.

“Many students see instructor commentary as not constructive but prescriptive directions that must be followed so that their grade, not necessarily their writing, can be improved. Research offering heuristics for improving such commentary is available for guidance, but the methods employed to comment on writing still have not changed significantly, primarily because we lack sufficient understanding of how students use feedback. Usability evaluation is ideally equipped for assessing how students use commentary and how instructors might adapt their comments to make them more usable. This article reports on usability testing of commentary provided to students in an introductory technical writing course.”

Kimberly C. Harper

Response-to-complaint letter as a rhetorical genre

Schaefer, K. A. (2010). *IEEE Transactions on Professional Communication*, 53, 158–163.

“Standard in many professional communications classrooms is the teaching of the general business letter and sometimes, more specifically, the complaint letter. This tutorial draws upon the scholarly research from professional communication, education, and business to address the methods of how to teach a response-to-complaint letter. I recommend a theory-based tutorial for the undergraduate professional communication classroom. This tutorial complements existing teachings on standard form-letter writing and could serve as a supplemental component to a marketing or management course.”

Gowri Saraf

Specific oral communication skills desired in new accountancy graduates

Gray, F. E. (2010). *Business Communication Quarterly*, 73, 40–67.

“International research findings and anecdotal evidence alike suggest that new accountancy graduates often begin their careers with inadequate oral communication skills. However, there is a lack of well-grounded empirical data concerning precisely what accountancy employers mean by ‘oral communication’ and what specific skills they value most highly. This article describes a research project investigating the importance of 27 oral communication skills for students intending to begin an accountancy career in New Zealand, as perceived by chartered accountancy professionals. It also examines how frequently accountancy employers are finding these desired skills in new graduates. The findings reported in this study offer important guidance concerning the oral communication skills that new graduates will find most useful in the New Zealand accountancy workplace and suggest useful directions for accountancy students internationally.”

J. A. Dawson

Student and faculty perceptions of engagement in engineering

Heller, R. S., Beil, C., Kim, D., & Haerum, B. (2010). *Journal of Engineering Education*, 99, 253–261.

This study does not address technical writing courses that engineering students complete, but it suggests context for teacher-student relationships and their definitions for the term *engagement*. “This study is designed to investigate how undergraduate engineering students and their faculty define engagement. While many researchers provide descriptions and suggestions that engagement is crucial to learning, there is no widespread, standard definition for engagement to guide engineering educators The purpose of this study is to begin to understand student engagement by examining how students and faculty viewed the term engagement as it relates to their engineering courses. The two key questions asked were (1) How do faculty and undergraduate students define engagement? and (2) How are their definitions similar or different? Students view engagement in terms of faculty enthusiasm for the subject and in teaching and the availability of faculty for out-of-class interactions. Faculty members believe that engagement rests with the students This study suggests that there is not a single definition of engagement for engineering students. Rather, engagement is both a process and an outcome. Faculty stimulate engagement by providing students with active learning experiences, conveying excitement and enthusiasm for their subject, and providing opportunities for student-faculty interactions. Students show their engagement by participating in class discussions, doing research projects, and interacting with their professors and peers.”

Sherry Southard

Technical communication internship requirements in the academic economy: How we compare among ourselves and across other applied fields

Savage, G. J., & Seible, M. K. (2010). *Journal of Technical Writing & Communication*, 40, 51–75.

“This article reports a study of internship requirements in technical communication programs compared

with three established professions and one emerging profession that have certification or licensing requirements for practitioners. The study addresses three questions about technical communication internship programs: (1) Are internships offered as a way to fulfill program academic credit requirements? (2) If internships are offered, are they required or elective? (3) What are the minimum/maximum academic credits allowed for internships toward fulfillment of program requirements and the number of workplace hours of internship required? To answer these questions we focused on three elements of internship program management: academic credits, workplace hours per academic credit, and total workplace hours required. Our findings indicate that there is considerable disparity for these factors among programs in our field and that we lack criteria similar to those used in established professions for internships.”

Valerie J. Vance

Ethical Issues

Ethical climate in government and nonprofit sectors: Public policy implications for service delivery

Malloy, D., & Agarwal, J. (2010). *Journal of Business Ethics*, 94, 3–21.

“An important factor that leads governments to engage in public service contracts with nonprofit organizations is the belief that they share similar ethical and value orientations that will allow governments to reduce monitoring costs. However the notion of the existence of similarities in ethical climate has not been systematically examined. The purpose of this paper is to investigate the ethical climate in government and nonprofit sectors and to determine the extent to which similarities (and differences) exist in ethical climate dimensions. Using survey data and structural equation modeling technique, the factor structure equivalence and measurement invariance of the ethical climate in the two sectors are tested. Results indicate that while there is a significant overlap in shared perception of ethical climate dimensions, there are also key

differences between the two sectors. The outcome of this research provides important preliminary insights for public policy makers in government to better understand the implications of using the nonprofit sector for service delivery.”

Christine Cranford

Information Management

A coach approach to leadership: Empowering others during uncertainty and change

Scriffignano, R. (2010). *Best Practices*, 12, 57, 61–63. [Center for Information Development Management]

“This article explores how managers can use the coach approach to empower and lead people through uncertainty and change and emerge stronger and ready to take on new business challengers [The author discusses] how the coach approach evolved The coach approach framework [and] shifting the focus from one to many.”

Sherry Southard

Creating a customer survey

Tilley, B. (2010). *Best Practices*, 12, 74–79. [Center for Information Development Management]

The author covers “selecting an e-survey software company, creating the survey, testing the survey, sending out the survey, parsing feedback, [and] making post-survey decisions.”

Sherry Southard

How much does document conversion really cost?—A guide to conversion cost variables

Bridges, D. (2010). *Best Practices*, 12, 64–69. [Center for Information Development Management]

Because misconceptions about “how much it will cost to convert your documents to XML ... [a task in

which] a multitude of factors interact to determine the per-page price of any conversion project [T]his paper's objective is to serve as a resource for commercial organizations that are planning an XML conversion or trying to determine whether documentation conversion may be a cost-effective option."

Sherry Southard

Productivity counts: Measuring the effectiveness and productivity of your team members

Hackos, J. (2010). *Best Practices*, 12, 70–73. [Center for Information Development Management]

The author discusses ways to measure productivity "(1) The number of documents produced by our organization per year, including new and revised documents (2) the number of pages produced by our organization per year, new and revised, with a complexity weighting factor added in (3) the number of successful sets of functional information delivered to the users each year (4) the amount of rework staff members generate for themselves and everyone else on the support team [She explains] we can obviously measure productivity by looking at the output of our work effort. We can also measure the efficiency with which we perform our tasks (1) Record the time it takes to develop a document or complete a project from the beginning to the end of the information-development life cycle (2) The percentage of total project time spent on each milestone (3) The percentage of time spent on each key project task. You may also want to measure the percentage of time spent on key tasks."

Sherry Southard

Recycled writing: Assembling actor networks from reusable content

Swarts, J. (2010). *Journal of Business and Technical Communication*, 24, 127–163.

"Drawing on a study of writers reusing content from one document to another, this study examines the rhetorical purpose of reuse. Writing reuse is predominantly studied through the literature on single sourcing and enacted via technologies built

on single-sourcing models. Such theoretical models and derivative technologies cast reusable content as contextless and rhetorically neutral, a perspective that overlooks the underlying rhetorical strategies of reuse. The author argues for a new understanding of reuse as a rhetorical act of creating hybrid utterances that gather their rhetorical strength by assembling ever larger and denser actor networks."

Kimberly C. Harper

Instructions

Creating procedural discourse and knowledge for software users: Beyond translation and transmission

Hovde, M. R. (2010). *Journal of Business and Technical Communication*, 24, 164–205.

"Although most theorists agree that discourse creates meaning, they have not adequately described how this process emerges within the creation of procedural knowledge. This article explores how technical communicators in diverse settings based discourse decisions on their knowledge of (a) users, (b) organizational image and constraints, (c) software structure and features, and (d) genre conventions in order to create communication artifacts designed to help users develop procedural knowledge. The transformations in which they engaged indicated that these technical communicators were skilled in forming images in these four areas and then using these images as they created meaning in procedural discourse. In this process, they moved beyond merely translating or transmitting technical knowledge."

Kimberly C. Harper

The effects of integrating on-going training for technical documentation teams

Catanio, J. T., & Catanio, T. L. (2010). *Journal of Technical Writing & Communication*, 40, 77–97.

"The tools and techniques utilized in the technical communications profession are constantly improving and

changing. Information Technology (IT) organizations devote the necessary resources to equip and train engineering, marketing, and sales teams, but often fail to do so for technical documentation teams. Many IT organizations tend to view documentation as an afterthought; however, consumers of IT products frequently base their purchasing decisions on the end user documentation's content, layout, and presentation. Documentation teams play a unique role in IT organizations as they help to build and create a public identity through end user manuals and the corporate website, as well as maintain intellectual knowledge through knowledge sharing and management. The technical communicator 'makes sense' of complex engineering specifications by creating user-friendly manuals for the layman. The practitioner who compiles and records this complex information is a valuable resource to any IT organization. Therefore, on-going training for technical documentation teams is essential to stay competitive in the fast-paced technical market. Technical communicators in IT organizations who only write end user manuals are becoming a rarity. Research indicates a marked trend toward technical writers in multiple roles and varied responsibilities that include web design and development, and business systems analysis functions. Although these added roles and responsibilities require training on some of the newer software tools and more complex programming tools, technical communicators are experiencing difficulty keeping pace with these tools. This article discusses technical documentation teams in IT organizations and provides an on-going training assessment to help technical documentation managers identify their team's strengths and weaknesses. In addition, measures and results from a study conducted at eight IT organizations, are provided to show the effect of how the integration of on-going training for documentation teams enhances individual competency and improves team performance."

Valerie J. Vance

A rhetoric of electronic instruction sets

Selber, S. S. (2010). *Technical Communication Quarterly*, 19, 95–117.

"This article offers a heuristic for conceptualizing the broad contours of electronic instruction sets as they have developed for and in online environments. The heuristic includes three interconnected models:

self-contained, which leverages the features of fixed instructional content; embedded, which leverages the features of user-generated metadata; and open, which leverages the features of mutable instructional content. Although the models overlap to some extent, their distinctions help to illustrate the changing nature of online how-to discourse."

Valerie J. Vance

Safety warnings in tractor operation manuals, 1920–1980: Manuals and warnings

Tebeaux, E. (2010). *Journal of Technical Writing & Communication*, 40, 3–28.

"This article studies the history of one of the most critical, unresolved problems in mechanized agriculture: Tractor operators do not read the operation manuals, particularly the safety warnings. The result: sustained death and injury of these operators for well over a century. The article tracks the emergence of warnings in tractor operator manuals found in the archives of the University of Nebraska Tractor Test Museum (1919–2007), describes efforts of manufacturers during this time to alert operators to dangers associated with tractors, and concludes with a summary of current research on tractor safety and the problem that remains unresolved: how to change the culture of farmers who use these implements, critical to agriculture production, to encourage them to read and follow safety practices."

Valerie J. Vance

Language

English or a local language in advertising: The appreciation of easy and difficult English slogans in the Netherlands

Hornikx, J., van Meurs, F., & de Boer, A. (2010). *Journal of Business Communication*, 47, 169–188.

"Studies have demonstrated frequent use of English in international advertising, but little is known about

people's preference for English versus local languages. This article empirically investigated the difficulty of the English language as a possible determinant of people's preference for English or the local language. In an experiment, Dutch participants judged a number of car ads with English slogans that were pretested as easy or difficult to understand. They were subsequently asked to express a preference for either the English slogan or the Dutch equivalent. Results showed that easy-to-understand English slogans were appreciated better than difficult-to-understand English slogans. Moreover, the degree of difficulty in comprehension of the English slogans affected participants' preference for English. English was preferred to Dutch when it was easy to understand; when it was difficult to understand, English was appreciated as much as the Dutch equivalent. In conclusion, the experiment provides empirical support for the role of comprehension in the preference for and appreciation of English in international advertising."

J. A. Dawson

Professional Issues

Answering the call: Toward a history of proposals

Meloncon, L. (2010). *Journal of Technical Writing & Communication*, 40, 29–50.

"While scholars have begun to write a history of reports and instructions, little scholarship exists on the history of proposals. To fill this gap, I analyze proposals written by Dorothy Wordsworth and Anne Macvicar Grant, ca. 1800. My analysis uses contemporary rhetorical theory to determine how they structured their writing and incorporated rhetorical appeals to achieve their goals. My findings show that their texts should be placed on a continuum of the history and development of the proposal genre. Further findings suggest that their use of contemporary rhetorical theories authorized Wordsworth's and Grant's discourse to successfully affect change."

Valerie J. Vance

Bring workplace assessment into business communication classrooms: A proposal to better prepare students for professional workplaces

Yu, H. (2010). *Business Communication Quarterly*, 73, 21–39.

"To help students better understand and be better prepared for professional workplaces, the author suggests that business communication teachers examine and learn from workplace assessment methods. Throughout the article, the author discusses the rationale behind this proposal, reviews relevant literature, reports interview findings on workplace assessment, and compares classroom and workplace practices to suggest areas where we can meaningfully bridge the two."

J. A. Dawson

Chrysler's "Most Beautiful Engineer": Lucille J. Pieti in the pillory of fame

Malone, E. A. (2010). *Technical Communication Quarterly*, 19, 144–183.

"The case of Lucille Pieti, a technical writer at Chrysler, serves as a discipline-specific illustration of some of Rossiter's (1995) generalizations about women scientists and engineers after World War II. Like other women with engineering degrees, Pieti emerged from college with high hopes, only to find herself consigned to one of the traditional ghettos for women scientists and engineers: technical communication. Her case is unusual, however, because she became a national celebrity."

Valerie J. Vance

Early Cold War professional communication: A rationale for progressive posthumanism

Brooks, R. C. (2010). *Technical Communication Quarterly*, 19, 31–46.

"Early Cold War professional communication teachers anticipated posthumanist awareness in our culture. They were also granted more agency for progressive action than many of their contemporaries. By showing the different ways that these scholars responded to their posthuman situation, this study articulates how posthumanist theory complicates the progressive notion

of a student-centered classroom and, more importantly, explains what happens to the progressive project when it is more explicitly connected to posthumanism.”

Valerie J. Vance

Posthuman rhetorics and technical communication

Mara, A., & Hawk, B. (2010). *Technical Communication Quarterly*, 19, 1–10.

“This special issue of *Technical Communication Quarterly* brings posthuman perspectives to bear on the kinds of metarhetorical, organizational, and intertextual problems that are central to technical communication. *Posthumanism* is a general category for theories and methodologies that situate acts and texts in the complex interplays among human intentions, organizational discourses, biological trajectories, and technological possibilities. These approaches counter theories that see human action and production from either the perspective of individual intention or the dominance of larger human discourses and mechanical structures. As organizations become more complex, technologies more pervasive, and rhetorical intent more diverse, it is no longer tenable to divide the world into human choice and technological or environmental determinism. Professional and technical communication is a field that is perfectly situated to address these concerns. [After presenting a history of posthumanism, the authors discuss] theoretical grounds for professional and technical writing. These two strains of posthumanism, one focused on culture and the other on complex systems, are both represented in the scholarship of professional and technical writing.”

Valerie J. Vance

(Re)Appraising the performance of technical communicators from a posthumanist perspective

Henry, J. (2010). *Technical Communication Quarterly*, 19, 11–30.

“Composition and rhetoric’s attention to writing as cultural performance is expanded to analyze writing as organizational performance. A Foucauldian understanding of discourse enables the diagnosis of

a technical writer’s annual performance appraisal as grounded in 20th-century Taylorized management principles. Tenets from posthumanism—including a discarding of the liberal humanist subject in knowledge production and a leveraging of distributed cognition for enhanced performance of humans acting in concert with intelligent machines—enable a theoretical framework for repurposing this genre.”

Valerie J. Vance

Reconceptualizing analysis and invention in a post-technê classroom: A comparative study of technical communication students

Miles, K. S. (2010). *Technical Communication Quarterly*, 19, 47–68.

“Technical communication pedagogy often uses two distinct processes to help students construct user-centered documents: audience analysis and invention. However, posthuman contexts, such as virtual reality, challenge traditional methods for audience analysis and invention. In virtual environments, knowledge is constructed by and through embodied interactions with people, technologies, spaces, and ideas—and the dual processes of analysis and invention are conflated. In this article, I present data from a semester-long comparative study between two technical communication courses. Students in both courses created instructions for filming in a virtual environment, but students from only one of these courses experienced the space/place of virtual reality. The data emphasize the importance of embodied experiences in technical communication pedagogy and practice.”

Valerie J. Vance

System mapping: A genre field analysis of the National Science Foundation’s grant proposal and funding process

Moeller, R. M., & Christensen, D. M. (2010). *Technical Communication Quarterly*, 19, 69–89.

“In this article we compare two different perspectives on the National Science Foundation (NSF) grant proposal and funding process: that depicted by the

genre-dominant NSF Web site and that articulated by several successful NSF-funded researchers. Using genre theory and play theory to map the respective processes, we found that a systems-based refocusing of audience analysis—namely, genre field analysis—allows researchers a more accurate understanding of their roles as agents within the system.”

Valerie J. Vance

Public Relations

A collaborative approach for media training between technical communication and public relations [Tutorial]

Lofstrom, J. (2010). *IEEE Transactions on Professional Communication*, 53, 164–173.

“Talking to the media often becomes part of the job description for subject matter experts (SMEs) who can discuss an organization’s research or new products. Media training can prepare SMEs for media interviews by helping them identify major points to discuss and showing them how to present that information to the reporter. Prior research in professional communication supports the need for media training for scientific or engineering SMEs based on the public’s increased interest in these areas. As part of this media training tutorial, I introduce eight guidelines based on my own experience as a public relations counselor and on research conducted in an organizational setting with SMEs in health information technology This paper has supplementary downloadable materials at <http://ieeexplore.ieee.org>. The file contains Appendix A.”

Gowri Saraf

Communicating corporate ethos on the Web: The self-presentation of PR agencies

Isaksson, M., & Flyvholm Jørgensen, P. E. (2010). *Journal of Business Communication*, 47, 119–140.

“This research examines credibility in the discourse offered on the corporate Web sites of 60 British, Danish, and Norwegian public relations (PR) agencies.

This study’s purpose was to see whether the North European PR industry moves in the direction of convergence or divergence in their corporate self-presentations. The authors have done this by unfolding the rhetoric and language of PR agencies Web sites. In this process, this study tried to determine whether the rhetorical strategies they use to achieve credibility show signs across the industry of becoming more focused on the responsibilities, enthusiasm, and caring nature of corporations and less directed at communicating expertise. Thus, the study expected to show whether PR agencies seek to build credibility by way of much the same rhetorical strategies and language, or whether they pursue different strategies in trying to build unique images. In analyzing the data, it is found that PR agencies across the three countries assign similar relative importance to expertise, trustworthiness, and empathy, and interestingly also that they strongly prioritize explaining their expertise at the expense of expressing their empathy for clients. To begin to understand this reluctance toward incorporating empathy in discourse, the authors investigate the linguistic representation of this one central dimension to explain its complexity and to point to the potential of an untapped resource for strategically managing self-presentation in business communication.”

J. A. Dawson

Scientific Writing

Accessibility and order: Crossing borders in child abuse forensic reports

Spafford, M. M., Schryer, C. F., Lingard, L., & Mian, M. (2010). *Technical Communication Quarterly*, 19, 118–143.

“Physicians write child abuse forensic reports for nonphysicians. We examined 73 forensic reports from a Canadian children’s hospital for recurrent strategies geared toward making medical information accessible to nonmedical users; we also interviewed four report writers and five readers. These reports featured unique *forensic inserts* in addition to headings, lists, and parentheses, which are typical of physician letters for patients. We discuss implications of these strategies

that must bridge the communities of medical, social, and legal practice.”

Valerie J. Vance

Technology

Censored!

Greengard, S. (2010). *Communications of the ACM*, 53(7), 16–18.

The author covers how “countries use Internet censorship to dominate the political dialogues ... [as well as censorship used] to create favorable conditions for government-controlled businesses ... [He describes] methods—including Domain Name system blocking, Internet Protocol blocking, or Uniform Resources Locator key word filters ... [along with forcing] Google and other search engines to self-censor their results [He expands about those methods in an insert and concludes] what sometimes appears to be censorship is actually rooted in economics.”

Sherry Southard

Computer graphics for all

Igarashi, T. (2010). *Communications of the ACM*, 53(7), 71–77.

“This article introduced our efforts to make computer-graphics authoring accessible to the general public, making it as much a daily communication tool as word processing and presentation applications. What most defines our research is its focus on end users. This opens up new application possibilities for existing technologies while posing unique technological challenges for interface researchers and developers.”

Sherry Southard

An interview with Edsger W. Dijkstra

Misa, T. J. (ed). (2010). *Communications of the ACM*, 53(8), 41–47.

This interview with programming pioneer Edsger Dijkstra (1930–2002) was conducted by CBI researcher Phil Frana at Dijkstra’s home in Austin, TX,

in August 2001 for a NSF-KDI project on ‘Building a Future for Software History.’ Winner of ACM’s A.M. Turing Award in 1972, Dijkstra is well known for his contributions to computer science as well as his colorful assessments of the field this interview has been condensed from the complete transcript, available at <http://www.cbi.umn.edu/oh>.”

Sherry Southard

Seven principles for selecting software packages

Damsgaard, J., & Karlsbjerg, J. (2010). *Communications of the ACM*, 53(8), 63–71.

This article provides “practitioners with a grounded set of principles to guide the selection of software packages The seven principles were derived empirically from a field study and from our understanding of software acquisition. The field study approach provided us with in-depth knowledge of a number of standards decisions made by actual organizations The principles extend beyond the two obvious but narrow factors of price and immediate features, to include a wider networked and multilateral view of software packages. We promote a view of buying software as a continuous process of constantly trying to match available packages with a base of already installed information systems, while anticipating future organizational needs and advantages in technology.”

Sherry Southard

thinkflickrthink: A case study on strategic tagging

Tisselli, E. (2010). *Communications of the ACM*, 53(8), 141–145.

“The growth both in quantity and diversity of online communities across the World Wide Web, along with a number of new technologies that enhance both social interaction and content management, have bred an array of increasingly participatory practices. Users ... can become extremely sensitive and protective of what they believe to be their rights [S]trategic taggers went beyond mere description, annotation or even expression, and tried to subvert the system by exploiting its own features. They tried to expand the

limits of the linguistic context of tagging, in order to be able to speak loudly and directly to those who run the Web site The fact that most of the collective protest tagging was done by a minority of protestors reflects a phenomenon that should be acknowledged when dealing with communities: the actions of a few can outweigh those of the many The study of the dynamics of uncoordinated semantic strategies within dense on-line communities is of enormous importance to gain a greater understanding of how social and linguistic interaction takes place in a technological environment, and how it can augment the users' potential for direct action."

Sherry Southard

Why do people tag? Motivations for photo tagging

Nov, O., & Ye, C. (2010). *Communications of the ACM*, 53(7), 128–131.

"Tagging, or using keywords to add metadata to shared content, is gaining much popularity in recent years. Tags are used to annotate various types of content, including images, videos, bookmarks, and blogs, through web-based systems such as Flickr, YouTube, del.icio.us, and Technorati, respectively. The popularity of tagging is attributed, at least in part, to the benefits users gain from effective sharing and from organization of very large amounts of information Given the growing popularity of tags as means of sharing and organizing large amounts of information, and since user participation is critical to the sustainability of content sharing communities, developers and managers of collaborative content sharing systems such as Flickr, del.icio.us, and YouTube may benefit from understanding what motivates users to tag The findings of the survey suggest that, as expected, both social presence and individual level motivations affect users' tagging level, with the exception of the Family & Friends motivation."

Sherry Southard

Usability Studies

The blank-page technique: Reinvigorating paper prototyping in usability testing

Still, B., & Morris, J. (2010). *IEEE Transactions on Professional Communication*, 53, 144–157.

"Arguably, usability testing is most effective when integrated into the user-centered design process. One way to encourage this integration is to reemphasize the value of paper prototyping. In a recent test of a university library website, we married low-fidelity paper prototyping with medium-fidelity wireframe prototyping. When user navigation led to nonexistent pages or dead ends, users were encouraged to create what they thought should be where there was nothing. This blank-page technique gave us insights into users' mental models regarding site content and design, providing developers with useful data concerning how users conceptualized information they encountered."

Gowri Saraf

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